

Original Research Article

A study of topical steroid induced facial dermatosis in Andaman and Nicobar Islands and to analyse the role of Demodex mite in its pathogenicity

Mansi Srivastava¹, Pradeep Balasubramanian^{2*}, Anjali J. Anil³

¹MBBS Student, ANIIMS, Port Blair, Andaman and Nicobar, India

²Assistant Professor, Department of Dermatology, ANIIMS, Port Blair, Andaman and Nicobar, India

³Research Scholar, Department of Social Work, Hindusthan College of Arts and Science, Coimbatore, Tamil Nadu, India

Received: 06 December 2018

Accepted: 22 December 2018

*Correspondence:

Dr. Pradeep Balasubramanian,
E-mail: drprady85@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: Topical corticosteroids (TCs) are widely abused all over our country due to its short term benefits and effortless over the counter availability. The rate of its abuse is more so in Andaman & Nicobar Islands (A&N). Henceforth we conducted a study to evaluate the topical steroid induced facial dermatosis (TSFD) in A&N and to analyse the role of demodex mite in its pathogenicity.

Methods: 58 patients with TSFD participated in this study. Details such as demography of patient, topical steroid used, duration of usage, reason behind its usage and facial dermatosis of the TSDF developed were collected. Following this, standardized surface skin biopsy (SSSB) was performed to assess the density of demodex mite. The details were statistically analysed.

Results: TSFD were predominantly seen in female of age group between 20 and 30 years. It was commonly misused to get rid of acne, pigmentation, tinea faciei and as a fairness cream. The commonly misused TCs were betamethasone cream followed by mometasone. It was commonly advised by pharmacists, friends, relatives, beauticians and GPs. Papules, pustules, photosensitivity and erythema were the commonly encountered adverse events. Microscopic examination of SSSB was negative in all the patients.

Conclusions: The study depicts rampant and irrational use of TCs in our population. Though the demodex mites were absent in the patients studied, further studies with larger sample size and in different ethnicity needs to be done to affirm its role in the pathogenicity of TSFD.

Keywords: Topical steroid facial dermatosis, Demodex mites

INTRODUCTION

Topical corticosteroids (TCs) are a useful tool in the therapeutic armamentarium of the dermatologists. However, in India because of the easy over the counter availability, affordable price, dramatic symptomatic relief of the skin problems and lack of knowledge about the

side effects has led to misuse and abuse of TCs. Various non-medical advisers like friends, neighbours, beauticians, barbers, etc. motivate others to use TCs as fairness/cosmetic creams, anti-acne, anti-fungal therapy and for any sort of skin eruptions. There is also a tendency to re-use the old prescription for a new onset skin disorder.

The rampant misuse of TCs has led to the development of various adverse effects (AEs). The cutaneous AEs include erythema, papulo-pustular eruptions, hypertrichosis, and telangiectasia.¹ Also, it is reported that patients using topical steroid had a significantly higher Demodex mite density than non-users.² Demodex mites are normal commensals in the pilosebaceous units. Proliferation of Demodex mites is associated with facial dermatosis such as rosacea, steroid induced dermatosis and acneform eruptions.³ Standardized skin surface biopsy (SSSB) technique is the gold standard to assess the density of these mites over facial skin.

The rate of TCs misuse is high in Andaman and Nicobar islands (A&N). Thus we performed a study to know the pattern of dermatosis emerging as a resultant of topical steroid misuse in A&N. SSSB was done in these patients to elicit the density of Demodex mites and to ascertain its role in the pathogenicity of topical steroid induced facial dermatosis (TSDF).

METHODS

A cross sectional study was performed in the Department of Dermatology, G.B. Pant Hospital, Port Blair (September 2017 to September 2018). Totally 58 patients participated in the study. The patients who had used topical steroid medication on face and developed acneform eruptions or rosacea were included in the study after recording their written consent.

Initially, information about the participants like age, gender, type of the topical steroid used, reason behind topical steroid application and duration of topical steroid usage were collected in each patient using a semi structured questionnaire administered by face to face interview.

The patients were carefully examined for the adverse effect due to topical steroid application on the face such as papules, pustules, nodules, erythema, telangiectasia and hypertrichosis. If present, the severity of each was graded as mild, moderate and severe. Photographs of the lesions were taken.

Following this, standardized surface skin biopsy (SSSB) was performed to assess the density of Demodex mite. It allows the collection of the superficial part of horny layer and the contents of the pilosebaceous follicle in which the mite resides. It is a standardized and non-invasive method.

Procedure of SSSB

For the biopsy, a circle of 1.15 cm in diameter was drawn on a glass slide (a surface area of approx. 1 cm²) and a drop of cyanoacrylate glue (non-toxic, non-irritant) was placed at the centre of the circle. The adhesive bearing surface of the slide was applied to the face on lesional site and left in place for about 1 minute. After removal, 2-

3 drops of normal saline was added to the peeled off glue containing the sample, which was then covered with a cover slide. The specimens were then examined by light microscopy. The mite density assessed in the slide from each was patient recorded. Visualizing more than 5 mites per cm² was considered as significant demodicidosis.

Statistical analysis

After collection of the data, it was entered in Microsoft excel and analysed using SPSS version 21. Qualitative variables were summarised as frequency, proportions and quantitative variables as mean or median and SD.

RESULTS

Of the 58 patients included in this study, topical corticosteroids were commonly misused by females (87.9%). The misuse was more in the age group between 20 and 30 years (67.2%) followed by those between 30 and 40 years (20.7%). The reason for misusing the TCs is mentioned in the Table 1. The common TCs misused are mentioned in Table 2. TCs were commonly advised by non-medical people such as pharmacists, friends, relatives and beauticians (62.1%) followed by general physicians (37.9%).

Table 1: Reasons for misusing the topical corticosteroid.

Reasons for misusing TCs	Frequency	Percentage (%)
Acne	21	36.2
Pigmentation removal	16	27.6
Fairness	4	6.9
Itching/tinea faciei	17	29.3
Total	58	100.0

Table 2: Common TCs misused.

Commonly misused TCs	Frequency	Percentage (%)
Betamethasone	20	34.5
Clobetasol	4	6.9
Fluticasone	3	5.2
Mometasone	31	53.4
Total	58	100.0

The mean duration of topical steroid usage in the patients studied was 8.89±7.8 months. The mean duration of the topical steroids usage following which the patients developed adverse effects such as papules, pustules, nodules and erythemo-telangiectasia was 2.3±1.2 months. The mean duration following which the hypertrichosis developed was 4.6±1.6 months.

The severity of the topical steroid induced facial dermatosis such as papules, pustules, erythema and telangiectasia were graded as mild, moderate, severe and

absent and mentioned in the Table 3 as numbers (n) and percentages (%). The papules, pustules and erythema were the commonly encountered TSFD and were commonly of moderate grade. Figure 1 depicts the lesions of TSDF in a patient. The nodular lesions and

hypertrichosis were of mild- moderate degree in 21 (36.2%) and 29 (50%) patients respectively. The details regarding the severity of nodules and hypertrichosis is mentioned in the Table 4.

Table 3: Papules, pustules, erythema and telangiectasia graded as mild, moderate, severe and absent and mentioned as numbers (n) and percentages (%).

Steroid induced dermatosis	Papules		Pustules		Erythema		Telangiectasia	
	N	%	N	%	N	%	N	%
Mild	12	20.7	16	27.6	11	19.0	6	10.3
Moderate	37	63.8	16	27.6	28	48.3	5	8.6
Severe	3	5.2	0	0.0	0	0.0	0	0.0
Absent	6	10.3	26	44.8	19	32.8	47	81.0
Total	58	100	58	100	58	100	58	100



Figure 1: Shows a patient with TC induced papules, pustules, nodules and hypertrichosis.

Table 4: Grading of nodules and hypertrichosis.

Steroid induced dermatosis	Nodules		Hypertrichosis	
	N	%	N	%
Mild	14	24.1	13	22.4
Moderate	7	12.1	16	27.6
Severe	0	0.0	2	3.4
Absent	37	63.8	27	46.6
Total	58	100.0	58	100.0

Demodex mites were visualized in 4 patients but the density was less than 5 per cm² in those slides. Hence they were not considered significant.

DISCUSSION

TCs are widely misused in A&N Islands. The main population indulged in the misuse of TCs in our study were found to be females (87.9%) and the age group primarily involved was 20-30 year (67.2%) which is quite similar to the study done by Santawana et al.⁴ This is probably because the younger age group and females are more concerned about taking care of the skin and general appearance.

In our study, the most common cause of TCs misuse was for acne treatment (36.2%) followed by itchy lesions on the face (29.3%) and pigmentation (27.6%) which is comparable to Nagesh et al.⁵ Study done by Sinha et al showed quite different results in which the most common reason for TC abuse was found to be lightening of skin in 74%.⁶

In the present study, the TCs molecule most commonly abused were mometasone (53.4%) followed by betamethasone (34.5%). Whereas in another study, betamethasone was the most commonly misused molecule (97.2%).⁵ This is because of the fact that vast number of products available in the Indian market contain betamethasone and mometasone as a stand-alone preparation or combination.

The mean duration of steroid application in our study was 8.89±7.8 months while in another study the duration of the usage of these creams varied from 1 day to 10 years.⁵ Around 62.5% patients had used these creams for a duration varying from 1 week to 3 months and 17.4% patients had used these creams from 3 months to 2 years.

As highlighted by Forton, *Demodex folliculorum* is a normal inhabitant of human facial skin and the normal density of *D. folliculorum* is ≤5 Demodex/cm² and the author states that a density of Demodex ≥5/cm² with a SSSB could be regarded as pathogenic.⁷ Also, it is reported that patients who received previous topical steroid therapy had a significantly higher number of mite

density than the patients who had received no topical steroids and according to data of that research, out of 53 perioral dermatitis patients who were previously treated with topical steroids, 40 were found to be positive for Demodex mite, with a mean density of $4.64 \pm 0.78/\text{cm}^2$.²

However, the present study revealed that out of 58 patients who were topical corticosteroid users, none of them were found to have significant demodicidosis. This can be because apart from the international studies, a study conducted in India documented demodicidosis as one of the rarest cutaneous infections of face and a case of it is said to be a 'diagnostic challenge' indicating low prevalence of this mite in Indian Population.⁸ In addition, a sampler sample size and single area of sampling in SSSB could be a reason which can explain absence of Demodex mite among the patients evaluated in our study.

It has been observed in the present study that majority of the patients were advised to use TCs by non- medicos such as pharmacist, friends, relative and beauticians. Apart from this, 37.9% of the patients were prescribed TCs by general practitioners. Various recent studies on prescription patterns of TCs have reflected similar TCs abuse. Nagesh and Akhilesh reported that out of 612 patients who had used the steroid, 301 had received the prescription from a sources other than doctors i.e. pharmacists, family and friends.⁵ Another study by Santwana et al showed that dermatologists contributed only 4.45% to the source.⁴ This clearly emphasizes the need to spread awareness to the public and pharmacists through newspaper articles, TV and radio programs. CMEs must be conducted by the local dermatologists to the GPs to discourage them from prescribing TCs irrationally.

The irrational use of TCs just for initial relief of the symptoms is a serious area of concern which can be explained by lack of awareness among patients and also because TCs are being portrayed as anti-acne and fairness creams through advertisements. Also, 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.⁹

To bring down the practice of TCs misuse and abuse, we need stringent actions and rules against the pharmaceutical companies who are marketing non-approved fixed dose combinations (FDCs) and against chemists who dispenses these medications without a valid prescription to regulate dermatological drug market in the country. Similar situation is hardly seen in western countries where FDCs are hardly used and topical steroids are never dispensed without prescription.¹⁰

However, in the absence of proper surveillance mechanisms by the Indian drug regulatory authority, IADVL Task Force against Topical Steroid Abuse (ITATSA) is a strong initiative in this direction. ITATSA is a special task force created by Indian Association of

Dermatologists, Venereologists and Leprologists (IADVL) to look into issues related to TC abuse.

CONCLUSION

This study was conducted considering the roaring issue of steroid misuse in A&N. This study describes the pattern of TSFD in A&N. Though the Demodex mites were absent in the patients studied, further studies with larger sample size and in different ethnicity needs to be done to affirm its role in the pathogenicity of TSFD. As a duty towards the community, various programs in TV and radio are being performed by us in A&N to spread awareness regarding the adverse effects of topical steroids. Newspaper articles were published. Let's join hands to fight this rising issue.

ACKNOWLEDGEMENTS

We express our heartfelt gratitude to the Department of Community Medicine and Microbiology, ANIIMS, Port Blair for helping us in certain areas of this study.

Funding: No funding sources

Conflict of interest: None declared

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

REFERENCES

1. Shih YL, Huang YH, Ho HC, Yang CH. Topical Steroid Induce Demodicidosis as a presentation of Hemifacial Rosacea-Like Lesion. *Dermatol Sinica.* 2009;27(2):111-6.
2. Lunder T. Density of Demodex folliculorum in perioral dermatitis. *Acta Derm Venereol.* 2005;85:211-5.
3. Zhao YE, Peng Y, Wang XL, Wu LP, Wang M, Yan HL, Xiao SX. Facial dermatosis associated with Demodex: a case-control study. *Journal of Zhejiang University SCIENCE B.* 2011;12(12):1008-15.
4. Mahar S, Mahajan K, Agarwal S, Kar HK, Bhattacharya SK. Topical corticosteroid misuse: the scenario in patients attending a tertiary care hospital in New Delhi. *Journal of clinical and diagnostic research: JCDR.* 2016;10(12):16.
5. Nagesh TS, Akhilesh A. Topical steroid awareness and abuse: a prospective study among dermatology outpatients. *Indian J Dermatol.* 2016;61(6):618.
6. Sinha A, Kar S, Yadav N, Madke B. Prevalence of topical steroid misuse among rural masses. *Indian journal of dermatology.* 2016;61(1):119.
7. Forton F, Seys B. Density of Demodex folliculorum in rosacea: a case-control study using standardized skin-surface biopsy. *Br J Dermatol.* 1993;128(6):650-9.
8. Kaur T, Jindal N, Bansal R, Mahajan B. Facial demodicidosis: A diagnostic challenge. *Indian J Dermatol.* 2012;57(1):72.

9. The Drugs and Cosmetics Rules, 1945. Ministry of Health and Family Welfare, Government of India.]. Available at <http://www.cdsc.nic.in/writereaddata/2016Drugs%20and%20Cosmetics%20Act%201940%20&%20Rules%201945.pdf>. Accessed on 15 December 2018.
10. What Over-the-Counter Treatments Are There For Atopic Dermatitis? Available at <https://atopic>

dermatitis.net/medications-over-the-counter/. Accessed on 15 December 2018.

Cite this article as: Srivastava M, Balasubramanian P, Anil AJ. A study of topical steroid induced facial dermatosis in Andaman and Nicobar Islands and to analyse the role of Demodex mite in its pathogenicity. *Int J Res Dermatol* 2019;5:67-71.