ISSN: 2279 - 0594

Journal of Biomedical and Pharmaceutical Research

Available Online at www.jbpr.in

CODEN: - JBPRAU (Source: - American Chemical Society)

Index Copernicus Value: 63.24

PubMed (National Library of Medicine): ID: (101671502)

Volume 6, Issue 4: July-August: 2017, 17-30

Research Article

ASSESSMENT OF TOPICAL CORTICOSTEROID USE IN DERMATOLOGICAL CONDITIONS OF PEDIATRIC POPULATION

Asra Pourgharashi[1], Sebin Toms Varghese[1], Mr. Binai K Sankar[2], Dr. Revanta Saha[3]

[1]Pharm D, Department of Pharmacy Practice, Acharya& B.M. Reddy College of Pharmacy, Bengaluru Soldevanahalli, Achitnagar (Post), Hesaraghatta Main Road, Bengaluru – 560 107.

[1]Pharm D, Department of Pharmacy Practice Acharya& B.M. Reddy College of Pharmacy, BengaluruSoldevanahalli, Achitnagar (Post), Hesaraghatta Main Road, Bengaluru – 560 107.

[2]M pharm, Assistant professor, Department of Pharmacy Practice Acharya& B.M. Reddy College of Pharmacy, BengaluruSoldevanahalli, Achitnagar (Post), Hesaraghatta Main Road, Bengaluru – 560 107.

[3]MBBS, MD, Assistant Professor, Dept. of DVL, Dr. B.R. Ambedkar Medical College,

Received 15 May 2017; Accepted 03 July 2017

ABSTRACT

Topical steroids are the topical forms of corticosteroids. Topical steroids are the most commonly prescribed topical medications for the treatment of rash, eczema, and dermatitis. **Objective:** To assess the use of topical corticosteroid in dermatological conditions of pediatric population and to study the choice of TCs given in department of dermatology in patients below 18 years old & to identify the common adverse drug reactions of the topical corticosteroid use. **Methodology:** The prospective observational study carried out in pediatric patients over a period of 6 months (November 2015 to April 2016) in the department of Dermatology at Ambedkar medical college. Based on the inclusion criteria 50 patients were selected and were informed the purpose of the study and details were collected using the proforma developed, which is approved by the pharmacy practice department. The relevant data were collected and documented in the suitably designed patient data collection form. The data were analyzed descriptively. **Result:** The study included 50 patients drawn from OP units of the department of dermatology. In the study population, there were 54% females and 46% males. Majority of the patients were in the age group 2-12 including 12 males (44.44%) and 15 females (55.55%). In the study, 10 patients was diagnosed with dermatitis (10 patients), followed by steroid modified acne (7 patients), urticarial (6 patients), acne vulgaris (5 patients), eczema (5 patients), pityriasisalba (3 patients). Out of 50 topical steroids prescribed, the most common topical steroid was MomentasoneFuroate (18, 36%) followed by Desonide (15, 30%), Fluticasone (7, 14%), Clobetasol Propionate (5, 10%), Betamethasone (4, 8%), Hydrocortisone (1, 2%). **Conclusion:** Our study aims to assess the use of topical corticosteroids in dermatology in pediatric population and identify the ADE. Female patients were found with more dermatological conditions. Moisturizers were the most commonly prescribed category of drug.

Keywords: Topical corticosteroids, Pediatric, Dermatological conditions, adverse drug events.

Introduction

Topical corticosteroids use in pediatric is significant to study due to thinner skin and larger surface area of pediatric compare to adults. Prescribing practices are a reflection of health professional s ability to determinate the various choice of drugs and determine the once with most beneficence. Children are most vulnerable to the various ADE related to use of drugs.

The objective of our study is

- To study the choice of topical corticosteroids given in department of dermatology in patients below 18 years old.

Corresponding author: Sebin Toms Varghese | E-mail: sebintomsvarghese@gmail.com

➢ To identify the common adverse drug reactions of the topical corticosteroid use.

Corticosteroids are a class of steroid hormones, produced in the adrenal cortex of vertebrates, involved in a wide range of physiological processes, including stress response, immune response, and regulation of inflammation, carbohydrate metabolism, protein catabolism, blood electrolyte levels, and behavior. Topically used corticosteroids were first introduced in 1952 by Sulzberger and Witten. In the six decades since, they have completely changed the face of therapy of dermatological disorders. Although safe when used in moderation at known doses, they produce serious local, systemic and psychological side effects when abused. Topical Corticosteroids are very often misused since they are easily available over-the-counter. Many OTC preparations used in skin care, like fairness preparations and anti-acne preparations are known to contain corticosteroids. The misuse or excessive use of corticosteroids in the pediatric population is a grave issue. It is a common sight that adolescents use topical corticosteroids in the form of OTC preparations for home care of acnes and to enhance fairness. This non-prescription use of topical corticosteroids has led to development of serious local side-effects including scarring of skin.[1]

Corticosteroids are normally used to treat conditions such as asthma, urticarial (hives), atopic eczema, chronic obstructive pulmonary disease, multiple sclerosis. They are available in various forms including, but not restricted to, Oral dosages, parenteral dosages, & inhalers and as topical formulations like lotions, gels, creams and ointments. It was the pivotal paper of Sulzberger & Witten in 1952 on compound F (later named Hydrocortisone) that introduced TCs into dermatology.[2]

A large number of modifications of the original Compound F (Hydrocortisone) were discovered in rapid succession. These included Fluorohydrocrtisone (1955); Triamcinolone acetonide (1958); Fluocinoloneacetonide (1961); Betamethasone (1963); Clobetasone propionate (1974); Clobetasone butyrate (1978); Fluticasone (1990); Halobetasone (1990); Mometasone (1991) and a host of other molecules. These molecules varied in potencies as determined by their vasoconstrictive properties. The availability of such a wide variety of corticosteroids proved to be bane than a boon to dermatologists. The side-effects of the drugs gradually became apparent soon after their honeymoon period, becoming gradually more acute with rampant and unlimited misuse of the drug particularly by non-dermatologists.[1]

The fact that there are varying potencies of topical corticosteroids; the therapy of various inflammatory cutaneous disorders became more effective & less time consuming. Despite instances of abuse & misuse leading to serious side effects, they remain one of the most valuable currently available treatments, and if used properly, can control symptoms and restore patients' quality of life.

The strength of the topical medication is influenced more by the vehicle, the type of base used to contain the medication and type of corticosteroid, than the percentage of medication dissolved in the vehicle. If the percentage and type of topical corticosteroid were to be kept constant, the following list would represent the strength of the medication, from highest to lowest:-

- Ointment (highest)
- Creams
- Lotions (lowest)

Ointments are greasy, but have the lowest risk of burning and stinging with application. Solutions, gels and sprays are newer, often more complex formulations, some stronger and some weaker than lotions or creams containing the same medication. According to WHO classification, topical corticosteroids come in various strengths, ranging from "super potent" (Class I) to weaker, "least potent" (Class VII).

Table I: Classification of Topical Corticosteroids by potency .[4]

Class	Potency	Example
I	Super potent	0.05%Clobetasol Propionate 0.1% Fluocinomide
II	Potent	0.05% Halobetasol propionate 0.01% Fluocinamide
III	Upper mid strength	0.05% Desoximetasone 0.05% Fluocinamide
IV	Mid strength	0.1% Momentasonefuroate 0.1% Betamethasone Valerate
V	Lower Mid strength	0.1% Momentasonefurate 0.1% Betamethasone valerate
VI	Mild potent	0.025% Triamcinoloneacetamide 0.1%Hydrocortisonebutyrate
VII	Least potent	2.5% Hydrocortisone 0.5% Hydrocortisone

The World Health Organization defines Pediatrics as the branch of medicine that deals with the medical care of infants, children, adolescents with age limit from birth up to 18 years old. Pediatrics are classified as - New Born (Birth to 2 months), Infants (2 months to 2 years), Children (2 years to 12 years) and Adolescents (12 years to 18 years).[3]

The most common dermatological condition, according to American Academy of Dermatology, was Acne, with a prevalence of about 85%. The other common disorders are Moles, Chicken pox, Hives, Eczema, Psoriasis which is caused by microorganism like bacteria, fungi and virus [4]. The most common dermatological conditions in the Indian scenario, however, was Pyoderma (35.6%) followed by scabies (22.4%), eczema (17.6%).[5]

Topical Corticosteroids act as an Anti-Inflammatory, Immunosuppressive, Anti-proliferative and Vasoconstrictive agent. The Anti-Inflammatory effect of TCs is mediated by the inhibition of phospholipase A2 release, which is necessary for production of Prostaglandins, Leukotrienes, and Arachidonic acid derivatives. It has also been proposed that corticosteroids inhibit phagocytosis & stabilize the lysosomal membrane of phagocytizing cells.

The Immunosuppressive effects of topical corticosteroids are mediated by their ability to significantly suppress the production & action of humoral factors involved in the inflammatory response, to inhibit the migration of leukocytes to the site of inflammation & to interfere with the function of granulocytes, endothelial cells, mast cells & fibroblasts.

The Anti-Proliferative effect of topical corticosteroids is mediated by their ability to interfere with DNA synthesis &mitosis, in addition they also inhibit fibroblast activity & collagen formation. The vasoconstrictiveeffects of topical corticosteroids are not yet completely understood, but it is believed that the effect on super facial dermal vessels may be mediated via inhibition of natural vasodilators including anti histamines, bradykinins and prostaglandins.[6]

The permeability of topical corticosteroids is more in infants and children due to the thinner skin and a higher skin area ratio in relation to their body weight. This is even more in premature infants who have a much thinner skin. The absorption can be further increased when the drug is applied under a diaper because of the occlusive effect of the diaper. The metabolism of the absorbed glucocorticoids is also less rapid in children and infants. The combination of excess absorption and less metabolism causes suppression of endogenous cortisol production. Although topical corticosteroids are relatively safe, they can produce local (more frequent) and systemic (infrequent) adverse effects when used incorrectly. High potency topical corticosteroids should not be used on areas of thin skin (for

example face, flexural sites, scrotum, and eyelids) as absorption is increased. They should not be used on denuded skin or for longer periods. These pose as challenges when using topical corticosteroids in the pediatric population.

The Side effects of topical corticosteroids can be divided broadly into local and systemic. Local side effects of topical corticosteroids can be defined as the side effects occur on the skin at the site of drug administration. Some examples are – Atrophy, Striate, Rosacea, Perioral Dermatitis, Acne, Purpura, Hypopigmentation, Delayed wound healing and TSDF (Topical Steroid Damaged Face). Systemic Side Effects can be defined as the side effect relating or affecting the entire body or an entire organism. For Example - Suppression of the hypothalamic pituitary adrenal axis (Eg: Bethamesanoedipropionate and Diflorasondiacetate), Hyperglycemic & diabetes Mellitus, Mineralocorticoid effects (Eg: 9-a-Fluoroprednisolone)

The systemic adverse effects are more likely develop when highly potent topical corticosteroids are used for prolonged period of time (more than 6 months) on the thin skin or on inflamed surfaces.

Some important factors that need to be considered when topical corticosteroids used are: (a) the site of application, (b) the potency of the drug, (c) age of the patient, (d) duration of application, and (d) indication for usage. Caution is needed if these drugs are used under occlusion, in children. Atrophy of the skin is one of the most common cutaneous adverse effects. There is an increase in skin transparency and brightness, telangiectasia, striate and easy bruising. Scars and ulceration may appear due to dermal atrophy. The use of topical corticosteroids on the face can induce eruptions such as steroidal rosacea, acne and perioral dermatitis. Less frequent local adverse effects include hypopigmentation, delayed wound healing and glaucoma when corticosteroids are applied around the eye. Contact sensitivity to preservatives in the product or the corticosteroid itself may occur and clinically it can be suspected by persistence or worsening of the skin disease. *Systemic adverse effects are uncommon and are associated with the use of high potency topical steroids in large or denuded areas, under occlusion or in severe skin disease. Reversible suppression of the hypothalamic-pituitary-adrenal axis has been described in children with doses as little as 14 g per week. Stopping therapy abruptly may induce an Addisonian crisis. Other systemic effects include Cushing's syndrome, diabetes mellitus and hyperglycemia.*[7]

The chronic misuse of topical corticosteroids results in psychological and physical (cutaneous) dependence on the drug. Any attempt to stop the offending drug leads to a rebound or flare in the symptoms which becomes both physically and psychologically distressing to the patient. Thus, in order to maintain normal or near normal social functioning, the individual continues using the drug. Any attempt to withdraw it fails or is resisted by the patient. Topical corticosteroid phobia (TCP) occupies a position at the extreme opposite end of the spectrum of topical corticosteroid-addiction. Topical corticosteroid phobia is defined as a fear vis-à-vis the topical corticosteroid, rational or not. Although this fear is difficult to grade, it is an important factor that affects compliance adversely. In fact topical corticosteroid phobia is a new phenomenon that has emerged probably because of rampant topical corticosteroid abuse.

Inappropriate usage of topical corticosteroids can lead to side-effects some of which such as depigmentation have led to the use of the medication as a "fairness" cream. Some patients may become dependent on the drug and use the drug randomly by purchasing it directly from the chemists who are allowed to sell the drug freely without a dermatologist's prescription. Early reports of topical corticosteroid dependence or addiction were published in 1973 by Burry and in 1976 by Kligman and Frosch. On the flip side, reports of serious topical and systemic side-effects of these drugs appearing regularly in the literature as well as overkill in campaigns about their rational use have gradually led to a phobia regarding the drug among a section of the population both in India and abroad.[8]

This is the study on assessment of topical corticosteroids use in pediatric population which will help to review drug use and prescribing pattern.

METHODOLOGY

Study design and Human ethical clearance

This prospective observational study, carried out over a period of 6 months among out patients visiting outpatient department of Dermatology. The study protocol was approved by the Institutional Ethical Committee (IEC) with ethical clearance number: EC-386

Inclusion criteria:

- Patients of either sex.
- Patients of aged <18 years
- Patients attending to the Department of Dermatology.
- Patient with prescription containing at least one topical corticosteroid.

Exclusion criteria

- Patients who don't have complete data.
- Patients who are not willing to participate in the study.
- Patients above the age of 18
- Patients admitted to departments other than Dermatology

Method

All patients visiting the Out-patient clinic of the department of dermatology, and meeting the inclusion/exclusion criteria were enrolled by the investigators. The patients/caretaker wereinformed the details of the study and consent was obtained. The investigators interacted with physicians and other health care professionals in the Dermatology department. Data was collected from the patient case sheets, treatment chart, by communicating with the physicians and nurses, and from the patients. The data collected included demographics, pertinent diagnostic information, including laboratory data and prescription. The data was documented in a suitably designed case report form. The patient was followed up either through the telephone or in the next OP visit for topical or systemic side effects and was documented.

RESULT

A total of 50 pediatric patients till the age of 18 were enrolled based on the inclusion and exclusion criteria in a period of 3 months between November 2015 and January 2016, at Dr. B.R. Ambedkar Medical College and Hospital, Bangalore.

Distribution of children by gender

Out of total 50 children, 23 (46 %) were males and 27 (54 %) females.

Table 1: *Distribution of children by gender*

Gender	Distribution of patients	
	N	%
Male	23	46
Female	27	54
Grand Total	50	100

Age distribution of children in the study

Out of 50 children, majority of the patients (27, 54%) belonged to the age group of 2-12 years, followed by adolescent (17, 34%), infants (6, 12%). There was no neonate.

Table 2: *Age distribution of children in the study*

Class	Distribution of age	
	N	%
Adolescent (12 -18 years)	17	34%
Children	27	54%

(2-12 years)		
Infant (1 month – 2 years)	6	12%
Neonate (birth-1 month)	0	0
Grand total	**50**	**100**

Gender distribution in age groups

The maximum number of patients were in the age range of 2-12 including 12 males (44.44%) and 15 females (55.55%). 12 -18 age group consisted of 7 males (30.43%) and 10 females (37.03%). 1 month – 2 year group consisted of 4 males (17.39%) and 2 females (7.40%).

Table 3: *Gender distribution in age groups*

Age group	Males		Females		Total
	N	%	N	%	
Infant (1 month - 2 year)	4	17.39	2	7.40	6
Children (2 year- 12 year)	12	52.17	15	55.55	27
Adolescent (12 - 18 years)	7	30.43	10	37.03	17
Total	**23**	**100**	**27**	**100**	**50**

Distribution of indications

Out of 50 patients, 10 patients was diagnosed with dermatitis (10 patients), followed by steroid modified acne (7 patients), urticarial (6 patients), acne vulgaris (5 patients), eczema (5 patients), pityriasis Alba (3 patients).

Table 4: *Distribution of indications*

Indication	Males		Females		Total number	
	N	%	N	%	N	%
Dermatitis	1	10	9	90	10	20
Steroid Modified Acne	7	100	0	0	7	14
Acne Vulgaris	0	0	5	100	5	10
Alopecia areata	0	0	3	100	3	6
Urticaria	5	83.3	1	16.7	6	12
Eczema	1	20	4	80	5	10
Psoriasis	2	100	0	0	2	4
Insect Bite Reaction	1	50	1	50	2	4

Lichen Planus	0	0	1	100	1	2
Lichen striatum	0	0	1	100	1	2
Pityriasis Alba	3	100	0	0	3	6
Granuloma Amure	0	0	1	100	1	1
Hypopigmention	3	75	1	25	4	8
Grand total	23	100	27	100	50	100

Distribution of common topical steroids.

Out of 50 topical steroids prescribed, the most common topical steroid was MomentasoneFuroate (18, 36%) followed by Desonide (15, 30%), Fluticasone (7, 14%), Clobetasol Propionate (5, 10%), Betamethasone (4, 8%), Hydrocortisone (1, 2%).

Table 5: *Distribution of common topical steroids.*

Drugs	Distribution	
	N	%
MomentasoneFuroate	18	36.00
Hydrocortisone	1	2.00
Fluticasone	7	14.00
Desonide	15	30.00
Clobetasol Propionate	5	10.00
Betamethasone	4	8.00
Grand total	**50**	**100.00**

Drug distribution based on potency

The steroids used in this study were classified based on the WHO classification for steroids. Out of 50 corticosteroids, (50%) were mid strength potency, followed by mild potent (30%), super potent (5, 11.90 %), lower mid strength (2, 4.76 %), least potent (1, 2.38 %). There were no steroids of the Potent and Upper Mid strength classes.

Table 6: *Drug distribution based on potency*

Potency	Distribution	
	N	%
Super Potent	5	10
Mid Strength	25	50
Lower Mid Strength	4	8

Mild potent	15	30
Least Potent	1	2
Grand total	**50**	**100**

Distribution of drugs based on category

Out of 36 non-steroidal drugs, 19 drugs were prescribed as a moisturizer (19 times), followed by antipruritic (7 times) and immunosuppressant (4 times).

Table 7: *Distribution of drugs based on category*

Category	Distribution	
	n	%
Moisturizer	19	52.77
Antipruritic	**7**	19.44
Immunosuppressant	4	11.11
Antibiotic	3	8.33
Anthelmintic	1	2.77
Antifungal	1	2.77
Keratolytic	1	2.77
Grand total	**36**	**100**

Drug distribution based on dosage forms

Out of 36 number of non-steroid drugs prescribed, the majority dosage form prescribed was tablet (8 times), followed by capsule (6 times), ointment (5 times), and syrup (5 times)

Table 8: *Drug distribution based on dosage forms*

Dosage form	N	%
Ointment	9	25.00
Face wash	4	11.11
Powder	1	2.78
Shampoo	1	2.78
Tablet	14	38.89
Injection	1	2.78
Syrup	5	13.89
Soap	1	2.78
Grand total	**36**	**100**

Distribution of patients on number of drugs

Out of 50 patients, 18 patients were prescribed with 1 drug, followed by 17 patients with 2 drugs and 15 patients with 3 drugs.

Table 9: *Distribution of patients on number of drugs*

NUMBER OF DRUGS	NUMBER OF PATIENTS	PERCENTAGE
1 Drug	18	36
2 Drugs	15	30
3 Drugs	17	34
Grand total	**50**	**100**

Distribution of Patients based on ADE

Out of 50 patients, 5 patients were reported with ADE (10%) and 45 patients were not reported with any kind of ADE (90%).

Table 10: *Distribution of Patients based on ADE*

Category	Number	%
Patients with ADE	5	10
Patients without ADE	45	90
Grand total	**50**	**100**

Gender distribution of patients with ADE

Out of 5 patients who were reported with ADE, 4 were males (80%) and 1 was female (20%).

Table 11: *Gender distribution of patients with ADE*

Gender	N	%
Male	4	80
Female	1	20
Grand total	**5**	**100**

Distribution of drugs based on ADE

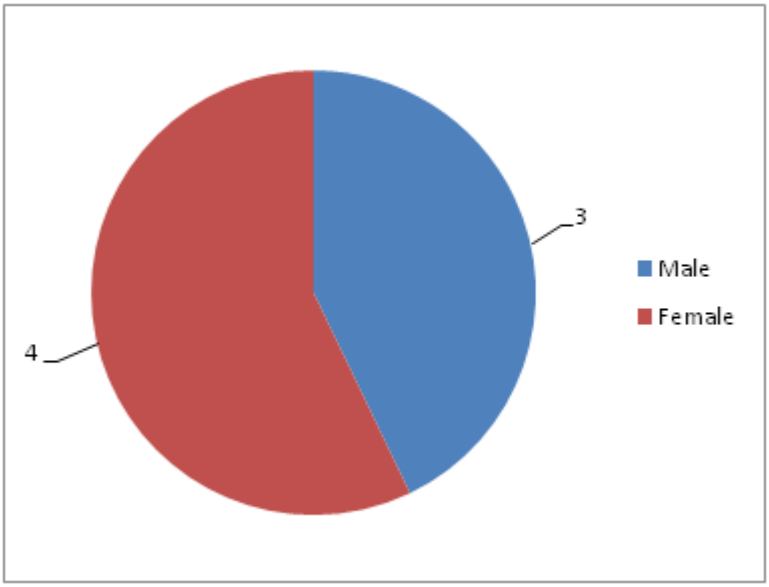
Out of 42 Topical corticosteroids prescribed, 18 patients were advised to take MomentasoneFuroate and among the 18 patients, 1 was reported with ADE. And 7 patients were advised to take Fluticasone, 1 was reported with ADE. 15 patients were advised to take Desonide and 2 were reported with ADE. 5 patients were advised to take Clobetasol propionate and 1 was reported with ADE.

Table 12: *Distribution of drugs based on ADE*

Topical Corticosteroid	Number of times prescribed	Patients with ADE	
		N	%
MomentasoneFuroate	18	1	5.55
Hydrocortisone	1	-	-
Fluticasone	7	1	14.28
Desonide	15	2	13.33
Clobetasol propionate	5	1	20
Betamethasone	4	-	-
Grand total	**50**	**5**	**10**

Misuse of the corticosteroids

Out of the 50 patients included in the study, 7 (14%) reported to have been using Betamethasone Furoate (0.1%) as OTC drugs. All the patients were adolescents and were in the age group of 13-18 years. Majority of the patients in this group were females (4) compared to males (3). All these patients developed steroid modified acne.



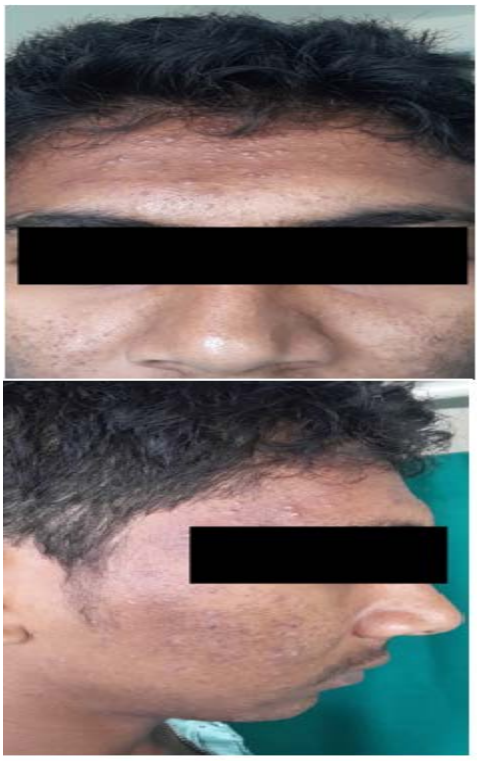


Figure 14: *Images showing topical corticosteroid induced rash*

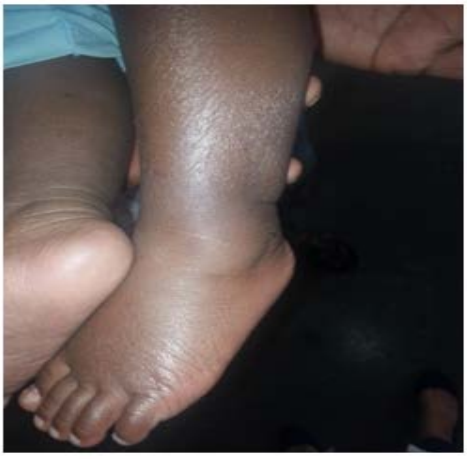


Figure 15: *Image showing Hypopigmentation due to MometasoneFuroate*

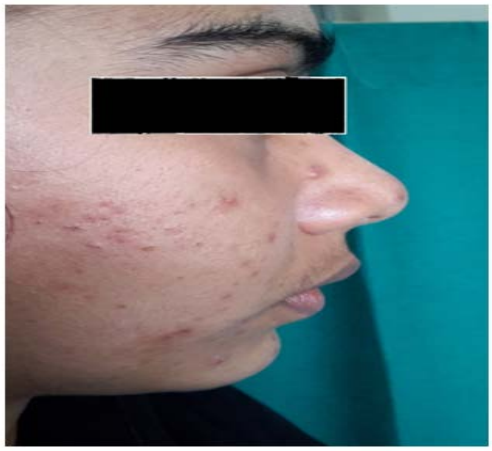


Figure 16: *Image showing topical corticosteroid induced exanthema*

Discussion:

The present study was a prospective observational study conducted over a period of three months, from November 2015 to January 2016, in the department of dermatology at Dr B R Ambedkar Medical College and Hospital. The study analysed the prescription pattern of topically used corticosteroids in the pediatric population. The study population was children below the age of 18 years who were brought to the out-patient clinic with dermal ailments.

A total of 50 patients were included in the study, with almost equal distribution of gender (46% males compared to 54% females). Majority of the children included in the study were of the age group 2-12 years (54%), while the least belonged to the age group of 1 month to 2 years (12%). While the number of male infants were more than females (17.39% compared to 7.40%), the trend was the opposite in adolescents, with more females than males (37.03% compared to 30.43%). The most common reason for prescribing topical corticosteroids was dermatitis (90% males compared to 10% females) followed by steroid modified acne (100% males compare to no female), urticaria (83.3% males compares to 16.7% females).

The most common topical steroid was momentasonefuroate (36%) which belongs to mid strength followed by Desonide (30%) and fluticasone (14%) which are belong to mild potent and clobetasone propionate (10%) belongs to super potent.

After the follow up, out of 50 patients, 5 patients who belong to age group 3-16 years old reported adverse drug events, due to the use of excessive dose of topical corticosteroids. Adverse drug events were noted in 20% patients using clobetasol propionate, 14.28% patients using fluticasone, 13.33% patients using desonide and 5.55% using momentasonefuroate.

In a similar study conducted by**RathiS**, the results are consistent with the results of our study. For the study, 5 cases of female patients who were using the TCs for an average time of 5 years were evaluated. The results were the reports of development of dermatitis which is similar to rosacea. With the continuous use of topical steroid the lesion spreads. The papules dry up and are replaced by a more diffuse redness. They started to use steroid cream as daily cosmetic/fairness cream. They all had magical response earlier; later started to develop rashes on stopping. This prompted them to discontinue the use. Betamethasone valerate (0.1%), Fluocinolone-acetonide (0.1%) and Betamethasone dipropionate (0.05%) were the main types of steroid used. In our study also females were the patient population who reported with more Adverse drug reaction.

Other than topical corticosteroids there were several non-steroidal drugs prescribed. Out of 36 drugs 52.8% were moisturizers comparing to 19.5% anti pruritic and 11.1% immunosuppressant. During the study of 50 patients 36% of patients got prescribed with 1 drug comparing to 34% patients with 3 drugs and 30% of patients with 2 drugs.

Our study is consistent with the study by **Hengge U R *et al.,*** which highlights the adverse effects of the topical corticosteroids. For the study, 202 reports of ADE were associated with the use of topical corticosteroids in the patient population. They found that betamethasone-containing products were most frequently implicated in reports of adverse reactions (79.4%). In our study we reported the 5 patients out of 50 experienced an ADE and the most common topical corticosteroid which caused ADE was Desonide (13.33%) comparing to 15 patients who were using desonide as a topical agent. For many patients, the intermittent use of topical corticosteroids is highly effective, bears little risk, and is relatively inexpensive. The authors concluded that long-term application of topical corticosteroids in high-risk settings (eg, application to gluteal folds, genitals, and groin areas in young patients) should be limited. In addition, topical corticosteroids should not be continued when the dermatoses failed to improve.

In the present study, about 50% of the prescriptions comprised of mid strength potency corticosteroids. This finding is very similar to a study conducted by **FleischerA B *et al.,***which showed that56.3% were low-potency and 38.7% were medium-potency agents.

The patients were followed up for adverse events for a period of one month after the initial consultation. Adverse events were reported by

10% of the patients, and all of them belonged to the 3-16 years age group. There were no drug-drug interactions between the topical corticosteroids prescribed and the other drugs prescribed to the patients.

BIBLIOGRAPHY

1. Coondoo A. Topical corticosteroid misuse: The Indian Scenario. Indian J Dermatol Venereol Leprol [Internet]. 2014 [cited 2016 Aug 6]; 59 (5): 451-5 Available from: http://www.ncbi. nlm.nih.gov /pmc/articles/PMC4171911/
2. Marion Sulzberger [Internet]. Wikimedia foundation, Inc.; c2015 [updated 2015 Apr 27; cited 2015 Dec] Available from: https://en.wikipedia.org/wiki/Marion_Sulzber ger
3. Pediatrics [Internet]. Wikimedia foundation, Inc.; c2016 [updated 2016 Mar14; cited 2016 Mar] Available from:https://en.wikipedia.org /wiki/Pediatrics
4. Basics of Topical Corticosteroids [Internet]. San Rafael: National Eczema Association. c2016 [cited 2016 Apr 6]. Available from: https:// nationaleczema.org/eczema/treatment/topica l-corticosteroids/basics-of-topical-corticosteroids/
5. Jain NA, Khandpur SU. Pediatric Dermatoses in India. [Internet]. 2010[cited 2016 Feb 7]; 76(5): 451-4. Availavle from: http://www.ijdvl.com/ article.asp?issn=0378-6323;year=2010; volume =76;issue=5;spage=451;epage=454;aulast=Jain
6. Tripathi KD. Essentials of Medical Pharmacology, 7th edition. New Delhi: Jaypee Brothers Medical Publishers; 2013. P. 895-6.
7. Topical Corticosteroids - Side Effects [Internet]. London: NHS Choices. c2016 [updated 2014 Dec 15; cited 2015 Dec]. Available from: http://www.nhs.uk/Conditions /Corticosteroid-preparations-(topical)/Pages/ Side-effects.aspx
8. Burry JN. Topical drug addiction: adverse effects of fluorinated creams and ointments. Med J Aus. [Internet]. 1973 [cited 2016 Jan];1(8):393-6. Available from:http:// www.ncbi. nlm.nih.gov/pubmed/4266903
9. Casey GA, Cooper SM, Powell JJ.Treatment of vulvar lichen sclerosus with topical corticosteroids in children: a study of 72 children. ClinExpDermatol [Internet] 5 Dec 2014[cited 2016 Feb 15]:40(3):289-92. Available from:http://onlinelibrary.wiley. com /doi/10.1111/ced.12519/citedby
10. Garzon MC, Lucky AW,Hawrot A, Frieden IJ.Ultrapotent topical corticosteroid treatment of hemangiomas of infancy.J Am Acad Dermatol[Internet]. Feb 2005 [cited 2016 Feb 15];52(2):281-6.Available from:http://www. ncbi .nlm.nih.gov/pubmed/15692474
11. Wahn U, Bos JD, Goodfield M, Caputo R, Papp K, Manjra A. et al. Efficacy and safety of pimecrolimus cream in the long-term management of atopic dermatitis in children [Internet]. 2002[cited 2016 Jan 15].Available from: http://www.ncbi.nlm.nih.gov/pubmed /12093983
12. Uziel Y, Feldman BM, Krafchik BR, Yeung RS,Laxer RM. Methotrexate and corticosteroid therapy for pediatric localized scleroderma [Internet]. Jan2002 [cited 2016 Jan 15];136:91-95. Available from:http://www.ncbi.nlm.nih. gov/pubmed/10636981
13. Cosar CB, Laibson PR, Cohen EJ, Rapuano CJ. Topical Cyclosporine in Pediatric Keratoplasty. Eye Contact Lens [Internet].2003 Apr[cited 2016 Jan 5]; 29(2):103-7.Available from: http://www.ncbi.nlm.nih.gov/pubmed/126957 14
14. Robaei D, Carnt N, Minassian DC, Dart JK. The Impact of Topical Corticosteroid Use before Diagnosis on the Outcome of Acanthamoeba Keratitis. Ophthalmology [Internet].2014[cited 2016 Jan 15];121:1384-8. Available from: http://www.aaojournal.org/article/S0161-6420(14)00093-1/abstract
15. Mooney E, Rademaker M, Dailey R, Daniel BS, Drummond C, Fischer G.et al. Adverse Effects Of Topical Corticosteroids In Paediatric Eczema. Aust J Dermatol. [Internet].2015[cited 2016 Feb 15];56(4):241-51. Available form: http://onlinelibrary.wiley.com/doi/10.1111/aj d.12313/abstract.
16. Aronson PL, Shah SS, Mohamad Z, Albert C. Topical Corticosteroids and Hospital Length of Stay in Children with Eczema Herpeticum. PediatrDermatol [Internet]. March-April 2015 [cited 9 August 2015]. Available from: http://onlinelibrary. wiley.com/doi/10.1111/j.1525-1470.2012.01859.x/abstract
17. Verma SB. Topical Corticosteroid Misuse In India Is Harmful And Out Of Control. BMJ

[Internet]. 2015[cited 2016 Jan 6]; Available from: http://www.bmj.com/content/351/bmj.h6079

18. Dey VK. Misuse of Topical Corticosteroids: A Clinical Study of Adverse Effects. Indian Dermatol Online J [Internet]. 2014 [cited 2016 Jan 15];5(4):436-40. Available from:http:// www.idoj.in/text.asp?2014/5/4/436/142486
19. Treesirichod A, Chaithirayanon S, ChansakulpornS. Self-Medication For Dermatologic Diseases Among Children Treated At The HRH Princess Maha Chakri Sirindhorn Medical Center. J Med Assoc Thai [Internet]. 2015Oct [cited2016 Jan 15];98:135-9. Available from: http://www.ncbi.nlm.nih.gov/pubmed/26817222
20. Hon KL, Tsang YC, Pong NH, Luk DC, Lee VW, Woo WM.et al. Correlations Among Steroid Fear, Acceptability, Usage Frequency, Quality Of Life And Disease Severity In Childhood Eczema. J Dermatolog Treat [Internet].2015 Oct;26(5):418-25.Available from:http:// www.ncbi.nlm.nih.gov/pubmed/12695714
21. Lee JY, Her Y, Kim CW, Kim SS.Topical Corticosteroid Phobia among Parents of Children with Atopic Eczema in Korea. Ann Dermatol[Internet]. 2015 Oct [cited 2016 Mar 28];27(5):499-506. Available from:http:// www.ncbi.nlm.nih.gov/pubmed/26512163
22. Roerdink EM, Flokstra-de Blok BM, Blok JL, Schuttelaar MA, Niggemann B, Werfel T, Van der HS. et al. Association of Food Allergy And Atopic Dermatitis Exacerbations. Ann Allergy Asthma Immunol [Internet]. 2016 Apr [cited 2016 Mar 20];116(4):334-8. Available from: http://www.ncbi.nlm.nih.gov/pubmed/26947239
23. Sigurgeirsson B, Boznanski A, Todd G, Vertruyen A, Schuttelaar ML, Zhu X. et al. Safety and efficacy of pimecrolimus in atopic dermatitis: a 5-year randomized trial. Pediatrics [Internet]. 2015 Apr [cited 2016 Feb 3];135(4):597-606. Available from:http:// www.ncbi.nlm.nih.gov/pubmed/25802354
24. Rathi S. Abuse of topical steroid as cosmetic cream: A social background of steroid dermatitis. Indian J Dermatol [Internet]. 2006 [cited 2016 Feb 8];51:154-5. Available from: http://www.e-ijd.org/text.asp?2006/51/2/154/26949
25. Hengge UR,Ruzicka T, Schwartz AR,Cork MJ. Adverse Effects Of Topical Glucocorti costeroids. J Am AcadDermatol [Internet]. 2006[cited 2016 Mar 7];54(1):1-15. Available from:http://www.ncbi.nlm.nih.gov/pubmed/16384751
26. Fleischer AB, Feldman SR. Prescription of High-Potency Corticosteroid Agents and Clotrimazole-Betamethasone Dipropionate by Pediatricians. ClinTher [Internet]. 1999 [Cited 2016 Feb];21(10);1725-31. Available from:http ://www.ncbi.nlm.nih.gov/pubmed/10566568