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Topical Corticosteroids Utilisation and Cost Variation in Dermatology Outpatient of a Tertiary Hospital in Kathmandu

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ABSTRACT

Introduction

Topical corticosteroids (TCs) are one of the important drugs prescribed in skin diseases. Cost is an important factor for compliance to treatment. Cost analysis provides the variation of costs which helps in economic benefit in the use of drugs. Thus the aim of the study was to assess the TC utilisation in Dermatology department and study its cost variation.

Methods

A descriptive cross-sectional study was conducted in the out-patient of Department of Dermatology, Nepal Medical College Teaching Hospital. Patient demographic, disease, name of topical steroid, vehicle, strength, single or combination, cost of the different brands of TCs were analysed.

Results

Out of 216 patients, 109 (50.5%) were females and 67 (31%) were of 21-30 years age group . Dermatitis was the most common skin condition encountered (106, 49.1%). Most common TC prescribed as single therapy was mometasone furoate 0.1%, (51, 23.6%) and betamethasone valerate 0.1% with fusidic acid, (48, 22.2%) as combination therapy. Mometasone furoate 0.1% cream, (15 gm) showed the maximum cost variation (94.7%) in single drug product while clobetasol propionate 0.05% with salicylic acid ointment (20 gm) showed the maximum cost variation (95.55%) in a combination product.

Conclusion

The commonest indication of TCs use in Dermatology outpatient during our study was dermatitis, with commonest TCs prescribed being mometasone furoate. Cream was the most favoured vehicle. Cost variation was as high as 95% . Reduction in this cost variation would ease the financial burden on patients which will help in improving the patient compliance in a resource limited population.

Keywords
Cost analysis, cost variation, dermatology, topical corticosteroids

INTRODUCTION

Topical corticosteroids (TCs) are one of the important drugs prescribed in skin diseases due to their excellent anti-inflammatory, antimitotic and immunosuppressant properties.[1] Along with efficacy and safety, cost of drugs is also an important factor influencing compliance to treatment.[2,3] In Nepal, many TC drugs are available as various brands and most of the time, clinicians also prescribe them by brand name.[4-7]

Analysis of utilization of drugs at the hospital level is an effective tool in formulation of guidelines for improving drug utilization patterns.[8] Cost analysis of TCs available in the market provides information on the variation of costs between various brands. This results in more effective and rational therapy as well as economic benefits in the use of drugs.

There are very few studies on TCs use and its cost analysis in Nepal. Hence, this study was carried out to assess the TC utilisation and its cost variation study of various brands in Dermatology Department.

METHODS

A descriptive cross-sectional study was conducted in the out-patient of Department of Dermatology, Nepal Medical College Teaching Hospital (NMCTH), Attarkhel, Kathmandu, from June 2021 - September 2021. Ethical approval was taken from the Institutional Review Committee of NMCTH. Informed consent was taken from the patients before the study. All age group of either sex prescribed with TC were included during the study period. Prescriptions which did not contain TC and drugs that are available under a single brand or of same cost for cost analysis were excluded. Patient age, sex, disease, name of TC, vehicle, strength, single or combination and price were recorded in the study pro-forma. Prescribed TC was classified according to their potency as per American Classification.[1,9] Cost of the different brands, both domestic and internationally produced TC which are prescribed during the study period, for sale in Nepal was obtained from different medicine importers and distributors inside Kathmandu Valley. The percentage of cost variations of similar drugs was calculated by using the formula:

Percentage cost variation = [(Maximum cost - Minimum cost)/(Minimum cost)]×100

Sample size was determined by the formula for cross-sectional studies $n=z^2pq/d^2$, where, 'n' is sample size, 'z' is standard normal deviate (1.96), that corresponds to 95% confidence level, 'p' is the expected prevalence of patients prescribed with topical steroids (28%),[10] 'q' is 100-p, i.e. =100-28 =72% and 'd' is error, i.e.=6%. By using the formula, sample size was calculated to 215.12. Hence, 216 patients were included in the study. The collected data was analysed with SPSS software version 16.00.

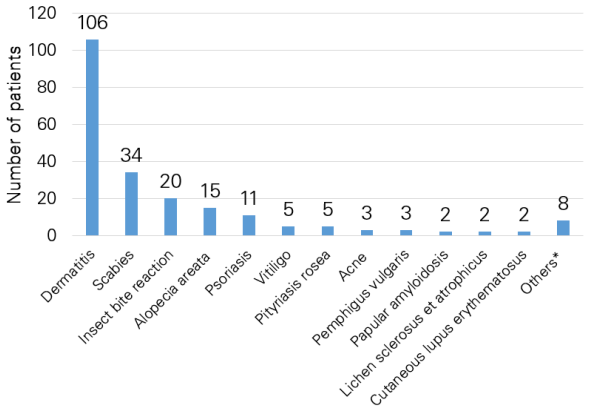
RESULTS

Out of 216 patients, 109 (50.5%) were female and 107 (49.5%) were male. Patients in the age group of 21-30 years (67, 31%) and 31-40 years (40, 18.5%) were most commonly affected as shown in Table 1.

Table 1: Age distribribution of patients (n=216)

Age group (years)	Frequency (%)
=<10	30 (13.9)
11-20	29 (13.4)
21-30	67 (31)
31-40	40 (18.5)
41-50	25 (11.6)
51-60	13 (6)
61-70	5 (2.3)
71-80	6 (2.8)
81-90	1 (0.5)

Most common skin conditions encountered were dermatitis (106, 49.1%), scabies (34, 15.7%), and insect bite reaction (20, 9.4%) as shown in figure 1.



**Others: miliaria rubra, pruritus of pregnancy, melasma, rosacea, chronic paronychia, scald burn, lichen planus, urticarial eosinophillic annular erythema*

Figure 1. Distribution of common skin diseases (n=216). *Others: miliaria rubra, pruritus of pregnancy, melasma, rosacea, chronic paronychia, scald burn, lichen planus, urticarial eosinophillic annular erythema

Most common TC prescribed as monotherapy were mometasone furoate 0.1%, (51, 23.6%), clobetasol propionate 0.05%, (34, 15.7%) and hydrocortisone 1%, (17, 7.9%) while those as combination therapy were betamethasone valerate 0.1% with fusidic acid, (48, 22.2%), clobetasol propionate 0.05% with gentamycin, (10, 4.6%) and hydrocortisone 1% with fusidic acid, (11, 5.1%) as shown in Table 2.

Table 2. Topical corticosteroids (single and combination) prescribed to the patients (n=216)

Topical corticosteroids	Frequency (%)
Single	
Clobetasol propionate 0.05%	34 (15.7)
Halobetasol propionate 0.05%	3 (1.4)
Betamethasone dipropionate 0.05%	5 (2.3)
Mometasone furoate 0.1%	51 (23.6)
Fluocinolone acetonide 0.025%	2 (.9)
Fluticasone propionate 0.05%	15 (6.9)
Hydrocortisone acetate 1%	17 (7.9)
Combination	
Clobetasol propionate 0.05% and salicylic acid	5 (2.3)
Clobetasol propionate 0.05% and gentamycin	10 (4.6)
Halobetasol propionate 0.05% and salicylic acid	4 (1.9)
Halobetasol propionate 0.05% and fusidic acid	2 (0.9)
Betamethasone dipropionate 0.05% and gentamicin	4 (1.9)
Mometasone furoate 0.1% and fusidic acid	4 (1.9)
Fluticasone propionate 0.005% and mupirocin	1 (0.5)
Betamethasone valerate 0.1% and fusidic acid	48 (22.2)
Hydrocortisone 1% and fusidic acid	11 (5.1)

Table 3. Commonly used vehicles for topical corticosteroid (n=216)

Vehicle	Number (%)
Cream	199 (92.1)
Lotion	9 (4.2)
Ointment	8 (3.7)

Table 4. Potency of prescribed topical corticosteroid (n=216)

Potency	Class	Frequency (%)
Super potency	I	58 (26.9)
High potency	II	0 (0)
Medium to high potency	III	10 (4.6)
Medium potency	IV	57 (26.4)
Medium to low potency	V	63 (29.2)
Low potency	VI	0 (0)
Least potent	VII	28 (13)

Table 3 shows the various formulations of prescribed TCs. Cream was the most frequently prescribed vehicle in 199 (92.1 %) of patients. Majority of topical steroids prescribed were medium to low potency, class V, in 63 (29.2%) of patients followed by super potency, class I, in 58 (26.9%) and medium potency, class IV, 57 (26.4%) of patients as shown in Table 4. There were no drugs prescribed from high potency, class II and low potency, class VI, TCs.

Among the TCs that were prescribed as single drug therapy, mometasone furoate 0.1% cream, 15 gm, showed the maximum variation in cost (94.7%) followed by hydrocortisone 1% cream, 15gm, (66.66%). Among the combination therapy, clobetasol propionate 0.05% with salicylic acid ointment, 20 gm, had the maximum cost variation (95.55%) followed by betamethasone valerate 0.1% with fusidic acid cream, 15gm (82.92%).

DISCUSSION

Topical corticosteroids, which were first introduced in early 1950s, are one of the most commonly prescribed medications in the specialty of dermatology.[11] Development of TCs have facilitated the treatment of many stubborn dermatoses making them more effective. Use of topical corticosteroid in various dermatological disorders is very safe and effective if correctly done, and is inexpensive as well.[12] In our study, majority of patients were young adults of age 21-30 years which is similar to study done by Gupta et al in India.[13]This is probably because people in this age group feel more concerned about their physical and cosmetic appearance. In our study, the most common skin condition for TC prescription was dermatitis which finding is comparable to the study done by Bylappa et al, where also dermatitis were most commonly encountered.[14] In our study, most common TC prescribed were mometasone furoate and clobetasol propionate which is similar to the another study done by Bylappa et al in which clobetasol propionate and mometasone furoate were commonly prescribed.[14] In our study, TCs were prescribed in a fixed dose combination with other topical agents like fusidic acid, salicylic acid, gentamycin and mupirocin which is similar to the study done by Abraham et al and Mirshad et al.[15,16]

Topical corticosteroids were prescribed in creams

Table 5. Cost variation in topical corticosteroids (single and combination)

Drugs	Dose	Maximum cost	Minimum cost	Percentage Cost variation
Halobetasol propionate 0.05% cream	15 gm	198	162	22.22
	30 gm	320	288	11.11
Betamethasone dipropionate 0.05% Cream	20 gm	80	54	48.15
Mometasone furoate 0.1% cream	5 gm	154	110	40
	15 gm	331	170	94.7
Mometasone furoate 0.1% lotion	30 ml	432	270	60
Fluticasone Propionate 0.05% cream	10 gm	159	103	54.36
Hydrocortisone 1% cream	10 gm	110	94	17.02
	15 gm	180	108	66.66
Clobetasol propionate 0.05% and salicylic acid ointment	20 gm	264	135	95.55
Halobetasol propionate 0.05% and salicylic acid ointment	10 gm	208	136	52.94
	15 gm	228	202	12.87
	30 gm	399	320	24.68
Fluticasone 0.005% and mupirocin ointment	10 gm	270	242	10.29
Betamethasone valerate 0.1% and fusidic acid cream	15 gm	150	82	82.92

formulations more commonly which is similar to study by Nerukar et al in which cream was the most commonly prescribed vehicle.[17] Multiple factors influence the choice of formulations for individual patients. Cream are less greasy and better suited for use in moist and weeping areas of skin.[18]

Majority of TCs prescribed were medium to low potency, class V, 63 (29.1%) followed by super potency, class I, 58 (26.9%) whereas in other studies done by Gupta et al and Nerukar et al super potency were commonly used.[13,17] The choice of potency is dictated by different clinical factors like age, site of lesion, type and severity of lesion, method of application etc.[12] Very potent TC use should be limited whenever possible. Prolong and excessive use of TC is always associated with the possible risk of suppression of the hypothalamus-pituitary-adrenal axis along with various local adverse effects.[1,17]

Various domestic and international TCs are available in various formulations in Nepal. This study has disclosed that the cost of most of the TCs have wide range of percentage cost variation among various brands which is disadvantageous for the patients, especially financially. Here in this study cost variation were seen maximum in mometasone furoate 0.1% cream 15gm, 94.7% with a single therapy and clobetasol propionate 0.05% with salicylic acid ointment, 20gm, shows the maximum cost variation of 95.55% with a combination therapy. Similar cost variation were also seen in the study done by Shareen et al where the cost variation in mometasone 0.1% was 501.42%.[19] This type of cost variation is not only seen in TCs but it is also seen in other medicine that are consumed by the patients in Nepal.[20-22] Cost is also one of the factors determining therapeutic compliance.[23] High cost can lead to poor patient compliance in taking medicine which ultimately leads to failure of treatment. If the information regarding the cost of drugs were easily accessible, then the treating physicians can prescribe the economical brands to reduce the patient's drug expense. However, enormous differences in cost between various brands of the same medicine should be monitored and controlled by the by the concerned regulatory authorities so as to ease decision making for drug prescribing physicians and reduce financial burden to the patients.

Mechanisms to reduce this cost variation would possibly minimize the financial burden on patients which can help in improving the patient compliance in a resource limited population.

The change in price of drugs is an ongoing phenomenon. The price presented here may subject to change each year. The sources of information for the cost variation were limited to selected retailers and distributors in Kathmandu valley. Unintentional exclusion of cost of certain TC brands that are available in the Nepalese market could not be ruled out.

CONCLUSION

The commonest indication of TCs in Dermatology outpatient was dermatitis, with commonest TCs being used was mometasone and clobetasol while cream was the most favoured vehicle. Cost variation as high as 95% was observed. Mechanisms to reduce this cost variation would possibly minimize

the financial burden on patients which can help in improving the patient compliance in a resource limited population.

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CONFLICT OF INTEREST

The author(s) declare that they do not have any conflicts of interest with respect to the research, authorship, and/or publication of this article.

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