

Hot Trends of steroid modified tinea at tertiary care hospital in India

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Abstract—Dermatophytes are the common fungal agents implicated in superficial skin infections worldwide, commonly known as tinea. They include species of Trichophyton, Microsporum and Epidermophyton. Infections of this organism have dramatically increased in last one decade by misuse of topical corticosteroids cream alone or in combination with topical antibacterial and antifungal agents. So this study was conducted with the aim to study about culprits (prescribers) and various offending agents. This study was conducted on 1239 consecutive patients of tinea between ages 1-70 years. Tinea was diagnosed by detailed history and clinical examination. Detailed inquiry was made for topical steroid use by recall method or relevant prescriptions. It was found that out of 1239, 1000 (80.7%) patients were using topical corticosteroid in any form. Most common age group was 21-30 years (38.3%). Pharmacist appeared as chief culprit (50.4%) and Clobetasol was major offending agent (34.8%). Majority (55.3%) of patients applied these formulations for 4 week or more. Study concluded that use of topical corticosteroids in tinea has become menace because of unethical manufacture, sales, prescription and end misuse by patient.

Keywords: *Dermatophytes, Topical corticosteroids, Tinea, Culprits, Offending agents.*

I. INTRODUCTION

Dermatophytoses constitute a group of superficial fungal infections of keratinized tissues, namely, the epidermis, hair, and nails.¹ The causative fungi are moulds belonging to three asexual genera *Microsporum*, *Trichophyton*, and *Epidermophyton*.² The distribution and frequency of dermatophytosis and their etiologic agents vary according to the geographic region studied, the socioeconomic level of the population, the time of study, the climatic variations, the presence of domestic animals, and age.³

It is an indisputable fact that there is an increase in the prevalence of dermatophytosis over last one decade across the country. One of the most formidable enemies that we have encountered in the recent times is the irrational fixed drug combination (FDC) creams containing a steroid, antifungal, and antibacterial with three to five molecules in the product.^{4,5} The corticosteroid may be added in the initial part of the treatment and improper use of the combination creams may lead to both failure of treatment and adverse reaction.^{6,7}

Topical corticosteroids used in combination with antifungal agents are very often potent molecules like Clobetasol propionate, they are available over the counter and are grossly abused which includes buying over the counter and applying it for weeks, months and sometimes years.⁸⁻¹³ This leads to

chronic, treatment resistant dermatophytosis which is causing a havoc in India. The present study was undertaken to assess burden of this misuse to draw attention of medical practitioners.

II. METHODOLOGY

This hospital based observational study was conducted in Department of Dermatology, Venereology and Leprology, JLN Medical College, Ajmer (Rajasthan) India.

This study included 1239 consecutive patients of age between 1-70 years, having clinically diagnosed tinea and who had given a written consent.

Each patient was evaluated for tinea in detail, including history regarding duration, qualification, name of FDCs, culprit and offending agent in FDCs. Out of 1239 such enrolled cases, 1000 patients were found using topical corticosteroid in any form. So these 1000 patients were interviewed and detailed inquiry was made for topical steroid use by recall method or relevant prescriptions. Information about prescriber (culprit) of these offending agents was also inquired. Results were presented in proportions.

III. RESULT

In this study, out of 1269 patients enrolled, 1000 (80.7%) patients of tinea were found using topical corticosteroid. Out of these 1000 patients having tinea who applied FDCs, there were 678(67.8%) male and 322 (32.2%) were female with male-to-female ratio 2.11:1. Maximum 383 patients (38.3%) seen in 21-30 years age group and patients of 50-60 years were least. In ≤ 20 year's males were more whereas in 21-30 years females were more. This sex wise distribution of age of these patients were found with significant ($p < 0.001$) variation. (Table 1)

Table 1
Age and sex wise distribution study population

S. No.	Age Group (in Years)	Male		Female		Total
		No.	%	No.	%	
1	≤ 20	186	27.43	21	6.52	207
2	21-30	205	30.24	178	55.28	383
3	31-40	142	20.94	51	15.84	193
4	41-50	52	7.67	30	9.32	82
5	51-60	29	4.28	17	5.28	46
6	61-70	64	9.44	25	7.76	89
	Total	678	100.00	322	100.00	1000

Chi-square = 86.708 with 5 degrees of freedom; P < 0.001

In this study, pharmacist of medical stores were chief culprit responsible for 504 (50.4%) patients and general practitioner stood second with 186 (18.6%) patients followed by Ayurveda and homeopathy treatment 114 (11.4%), paramedical staff 111(11.1%) etc., television advertisement 13(1.3%), insufficient treatment from medical college 50(5%). Paramedical staff and dermatologist were significantly more culprit in rural patients than urban patients. This residence of patient wise variation

in type of culprit person was found with significant ($p < 0.001$). (Table 2)

Table 2
Prescriber (Culprit) for Topical Steroid Misuse in Tinea Patients

S. No.	Prescriber (Culprit)	Urban		Rural		Total
		No.	%	No.	%	
1	Medical store/ pharmacist	230	53.00	274	48.41	504
2	Paramedical staff	25	5.76	86	15.19	111
3	General practitioner	101	23.27	85	15.02	186
4	Ayurveda/ Homeopathy/ Bangali	49	11.29	65	11.48	114
5	Incomplete treatment	19	4.38	31	5.48	50
6	Dermatologist	4	0.92	18	3.18	22
7	T.V Advertisement	6	1.38	7	1.24	13
	Total	434	100.00	566	100.00	1000

Chi-square = 36.056 with 6 degrees of freedom; P < 0.001

In this study, Clobetasol was principal offending component in these formulations found in 348 (34.8%) patients followed by Betamethasone in 172 (17.2%) patients, Beclomethasone 62(6.2%), multiple formulations 10(1%), Hydrocortisone 5(0.5%), Mometasone 10(10%). Whereas 297(29.7%) patients did not know about name and nature of formulation. 33(3.3%) individuals received treatment in form of local injections. And 22(2.2%) patients were using these FDCs on dermatologists prescription. In ≤ 20 years males were more whereas in 21-30 years females were more. This sex wise distribution of offending agents in these patients were found with significant ($p < 0.001$) variation. In males who told the name of offending agent used maximum were using Clobetasol followed by Betamethasone, Beclomethasone, injectable treatment, Insufficient treatment, Hydrocortisone and multiple formulation whereas in females maximum were using Clobetasol followed by Insufficient treatment, Betamethasone, Beclomethasone, Ringguard/Itchguard, Mometasone, injectable treatment and multiple formulation. (Table 3)

Table 3
Sex wise Misused Offending Agents in Tinea Patients

S. No.	Offending Agents	Male		Female		Total
		No.	%	No.	%	
1	Clobetasol	244	35.99	104	32.30	348
2	Betamethasone	141	20.80	31	9.63	172
3	Beclomethasone	37	5.46	25	7.76	62
4	Hydrocortisone	8	1.18	0	0.00	8
5	Mometasone	0	0.00	12	3.73	12
6	Insufficient treatment	13	1.92	35	10.87	48
7	Injectable treatments	27	3.98	6	1.86	33
8	Multiple formulations	3	0.44	4	1.24	7
9	Ring guard / Itchguard	0	0.00	13	4.04	13
10	Not told	205	30.24	92	28.57	297
	Total	678	100.00	322	100.00	1000

Chi-square = 116.620 with 9 degrees of freedom; P < 0.001

Regarding use of these offending agents according to education status of patient it was found that maximum such patient were with education primary to less than graduate followed by less than primary and more than graduate level. And 553(55.3%) patients applied these formulations for 4 a duration of weeks or more including years of application history in 25 (2.5%) patients. Those who were more than graduate apply these offending agent less or apply for less period. This variation of duration of use of

these offending agent according to education status of patient was found significant ($p < 0.001$).

Table 4
Education wise duration of steroid application in Tinea Patients

S. No.	Education	≤ 2 Weeks		2-4 Weeks		≥4 Weeks		Total
		No.	%	No.	%	No.	%	
1	≤Primary	66	35.68	60	26.09	95	17.18	221
2	Primary to < Graduate	74	40.00	140	60.87	380	68.72	594
3	≥Graduate	45	24.32	30	13.04	110	19.89	185
	Total	185	100.00	230	100.00	553	100.00	1000

Chi-square = 48.144 with 4 degrees of freedom; P < 0.001

IV. DISCUSSION

Misuse of topical corticosteroids in tinea patients was center point of our study to evaluate gravity of problem cause by these agents in form of extent, duration, resistance of disease and frequency of misuse. Misuse of these agents is due to regulation lacunae at various levels. Manufacturing and marketing misuse (in form of FDCs) is shortcoming of government policies over pharmaceuticals which allow these organizations to manufacture unethical combinations. Prescriptions and sales misuse like prescription of dermatologists may be incomplete with respect to quantity to be used, frequency, site, duration and prescriptions of non-dermatologists who do not consider the potency, site, duration and indication (e.g. super potent corticosteroid applied on groin for prolonged period for Tinea cruris) are served regularly at sales counters of chemists. With the same prescriptions, patients tend to repeatedly buy the same drug from the chemists without bothering to visit the doctor for further advice.¹⁴ However; many of these patients do not consult dermatologists initially or even later and apply steroids which are recommended by their friends, neighbors and relatives. It is only when their disease is aggravated by steroid application or complications set in either on the short or on the long run that they are forced to visit the dermatologist.

In this study, patients with topical corticosteroid use were 80.7% which is much higher than previous studies.¹⁵ Here, male outnumbered females. Philpot¹⁶ also suggested that males may be more vulnerable to infection due to the higher exposures in the army, school and sporting activities and due to the types of shoes and socks used. Maximum patients lying in 21-30 years age group which is different from previous authors.^{17,18} This may be due to access of FDCs containing topical corticosteroids in this group, ignorance and unawareness of health, accepting recommendations by their friends, neighbors, relatives, easy misdirected internet access, change of lifestyle and wearing tight clothes. All these factors mostly operate in this age group. Further, males of rural background suffered more because of unavailability of health care services, specialist consultation, poor hygiene and working in hot and humid environment.

Pharmacist/ salesperson at medical store owns 50.4% problem because of poor regulatory command of governing bodies. Secondly, there is a concept peculiar to India, where salespersons at chemist counters are considered equal to doctors by many lay persons. This peculiar concept arises from the theory that the salesman knows more about drugs than doctors since they are selling the drug. These salespersons also encourage such a concept principally to increase their sales and, to some extent, for ego satisfaction.¹⁹

Topical corticosteroids of almost every potency class was found to be misused but highly potent agent constitutes main load which is concordant with previous studies,⁸⁻¹³ suggesting unethical manufacture

and preference over other agent to claim high efficacy and fast temporary relief which are otherwise not justified.

Majority of patients used these formulations for more than 4 weeks of duration because of their property of quick relief and aggravation of disease symptoms on discontinuation, hence forming vicious cycle.

V. CONCLUSION

It can be concluded from this study that majority i.e. 80.7% of tinea patients were using topical corticosteroid in any form. Pharmacist appeared as chief culprit and Clobetasol was major offending agent. Majority of patients applied these formulations for 4 week or more. Study concluded that use of topical corticosteroids in tinea has become menace because of unethical manufacture, sales, prescription and end misuse by patient.

CONFLICT OF INTEREST

None declared till now.

REFERENCES

- [1]. Emmons CW. Dermatophytoses. In: Emmons CW, Binford CH, Utz JP, Kwon-Chung KJ, editors. Medical Mycology. 3rd ed. Philadelphia: Lea and Febiger; 1977. p. 117-64.
- [2]. Hay RJ, Moore MK. Mycology. In: Burns T, Breathnach S, Cox N, Griffiths C, editors. Rook's Textbook of Dermatology. 7th ed. Oxford: Blackwell Science; 2004. p. 31.5-31.60.
- [3]. Chinelli PA, Sofiatti Ade A, Nunes RS, Martins JE. Dermatophyte agents in the city of Sao Paulo, from 1992 to 2002. Rev Inst Med Trop Sao Paulo 2003;45:259-63.
- [4]. Verma SB. Sales, status, prescriptions and regulatory Problems with topical steroids in India. Indian J Dermatol Venereol Leprol 2014;80:201-3.
- [5]. Verma SB. Topical steroid misuse in India is harmful and Out of control. BMJ 2015;351:h6079.
- [6]. Lyngdoh CJ, Lyngdoh WV, Choudhury B, Sangma KA, Bora I, Khyriem AB. Clinico-mycological profile of dermatophytosis in Meghalaya. Int J Med Public Health 2013;3:254-6.
- [7]. Karmakar S, Kalla G, Joshi KR, Karmakar S. Dermatophytoses in a desert district of Western Rajasthan. Indian J Dermatol Venereol Leprol 1995;61:280-3.
- [8]. Siddappa K, Mahipal OA. Dermatophytoses in Davangere. Indian J Dermatol Venereol Leprol 1982;48:254-9.
- [9]. Kalla G, Begra B, Solanki A, Goyal A, Batra A. Clinicomycological study of tinea capitis in desert district of Rajasthan. Indian J Dermatol Venereol Leprol 1995;61:342-5.
- [10]. Kaur R, Kashyap B, Bhalla P. A five year survey of onychomycosis in New Delhi, India: Epidemiological and Laboratory aspects. Indian J Dermatol 2007; 52:39-42.
- [11]. Veer P, Patwardhan NS, Damle AS. Study of onychomycosis: Prevailing fungi and pattern of infection. Indian J Med Microbiol 2007; 25:53-6.
- [12]. Agarwal US, Saran J, Agarwal P. Clinico-mycological study of dermatophytes in a tertiary care centre in northwest India. Indian J Dermatol Venereol Leprol 2014; 80:194.
- [13]. Kumar S, Goyal A, Gupta YK. Abuse of topical corticosteroids in India: Concerns and the way forward. J Pharmacol Pharmacother 2016;7:7-15
- [14]. 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;77:160-6.
- [15]. Santwana Mahar *et al.*, Topical Corticosteroid Misuse: Indian Scenario in Patients attending a Tertiary Care Hospital in New Delhi India
- [16]. Philpot CM. Some aspects on epidemiology of tinea. Mycopathologia 1997;3:62
- [17]. Bindu V, Pavithran K. Clinicomycological study of dermatophytoses in Calicut. Indian J Dermatol Venereol Leprol 2002;68:259-61
- [18]. Patwardhan N, Dave R. Dermatophytosis in and around Aurangabad. Indian J Pathol Microbiol 1999;42:455-62
- [19]. Rathi SK, D'Souza P. Rational and ethical use of topical corticosteroids based on safety and efficacy. Indian J Dermatol 2012;57:251-9.