RESEARCH PAPER

Cross-sectional study on Steroid abuse and its impact on quality of life in dermatophytosis in a tertiary care centre

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ABSTRACT

Background: Indian clinic-based studies showed large reductions in quality of life (QoL) in many patients with dermatophytosis, with trends toward greater impairment in those previously exposed to topical corticosteroid preparations, hence this research was uptake.

Aim and Objectives: 1. To document individual cases of steroid-modified dermatophytosis. 2. To assess patterns of steroid misuse and their influence on disease morphology and chronicity. 3. To evaluate the impact of steroid abuse on quality of life using the DLQI. 4. To identify potential risk factors contributing to steroid misuse.

Methods: A descriptive, cross-sectional hospital-based study will be conducted over six months following ethical approval from the Institutional Review Board (Ref No: IHEC-I/3896/25) in 70 patients with dermatophytosis and a history of topical steroid use. Patient's demographic data was noted. Detailed clinical and dermatological examination including Dermatology Life Quality Index (DLQI) was done and findings recorded. Fungal confirmation will be done via KOH mount. Risk factor evaluation was done by collecting data on patterns of steroid misuse and various factors responsible. Association between patterns of steroid misuse and atypical morphology was tested via non-parametric tests and multivariate logistic regression with SPSS version 28 ($P<0.05$).

Results: Clinical presentation was in the form of extensive tinea corporis/cruris (20/28.6%), tinea corporis with atrophy (18/25.7%), tinea incognito (15/21.4%) mostly. Potent steroids were misused by 60% and moderate potent by 25.7% and FDC with antifungal by 14.3%. Over-the-counter purchase was the most frequent source (45.7%). Majority of patients (60%) reported very large to extremely large effect on quality of life. Age with adjusted OR_adj = 1.08, p = 0.0245 is a significant predictor, thus older age is associated with higher DLQI.

Conclusion: Steroid misuse frequently seen in dermatophytosis, which can lead to atypical, long term presentation with high psychosocial impact.

Keywords: Steroid-modified dermatophytosis, Tinea incognito, Topical corticosteroid misuse, Quality of life, Dermatology Life Quality Index, Public health.

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Introduction:

In the last decade India has experienced an apparent epidemic-like rise in chronic, recurrent and often atypical dermatophytosis. Several multicentric reports describe increasing case numbers, changing clinical patterns, frequent relapses and longer disease duration compared with historical experience [1,2]. Reported prevalence of superficial dermatophyte infections in India in community surveys and certain clinic-based series, ranges from 6.1% to 61.5% depending on

methodology, population and region [2,3]. A comprehensive literature synthesis of 1,038 studies covering 161,245 Indian cases (1939–2021) confirmed that dermatophytoses remain highly prevalent across the country and documented a recent shift in species distribution (from *T. rubrum* to *T. mentagrophytes/T. interdigitale* complex), along with an increasing burden of antifungal resistance in recent years [3,4].

A major proximate driver for the recent surge of chronic and recalcitrant presentations in India is the widespread, unsupervised use of over-the-counter (OTC) fixed-dose combination creams that include potent topical corticosteroids together with antifungals and antibacterials. These preparations are inexpensive, easily available and commonly applied without medical supervision; their irrational use causes local immunosuppression, masks classical morphology (giving so-called "steroid-modified tinea" or tinea incognita), promotes spread and chronicity, and is temporally associated with the observed rise in difficult-to-treat cases [1,3]. Thus an often delay in correct diagnosis and appropriate treatment which further contributes to treatment failure and prolonged disease courses [1,3] with a significant impairment of health-related quality of life (QoL).

Indian clinic-based QoL studies using the Dermatology Life Quality Index (DLQI) have documented moderate to large reductions in QoL in many patients with dermatophytosis, with trends toward greater impairment in those previously exposed to topical corticosteroid preparations [5]. Taken together, these epidemiologic and psychosocial data highlight the urgency of improved clinician awareness, patient education, stronger regulation of topical steroid–containing FDCs, and renewed efforts in antifungal stewardship and species-targeted therapy.

This study was conducted to characterize the clinical patterns of dermatophytosis in patients attending tertiary care with specific attention to steroid-modified presentations and to place these observations in the context of the evolving epidemiology and QoL burden documented in recent Indian literature.

Aim and Objectives

- To document individual cases of steroid-modified dermatophytosis.
- To assess patterns of steroid misuse and their influence on disease morphology and chronicity.
- To evaluate the impact of steroid abuse on quality of life using the DLQI.
- To identify potential risk factors contributing to steroid misuse.

Methodology

Study Design and Setting

A descriptive, cross-sectional hospital-based study will be conducted over six months at the dermatology department OPD, Chettinad Medical College and Research Institute., following ethical approval from the Institutional Review Board (Ref No : IHEC-I/3896/25).

Study Population

Consecutive patients aged ≥18 years with clinically diagnosed dermatophytosis, confirmed via KOH microscopy, will be invited to participate.

SAMPLE SIZE

Sample size was estimated by using nMaster software Version 2.0 by applying following details in the above formula. Based on the study "Steroid abuse, quality of life, and various risk factors in dermatophytosis: a cross-sectional observational study from a tertiary care center in northern India" by Dilip Meena et al, the prevalence of steroid abuse was (n = 511/550, 92.90%).[6] Based on the above parameter with an alpha of 0.05 (2 sided) and precision level of 6% the estimated sample size using the sample size formula for Single proportion. The above parameter and formula give us a sample size of 70 subjects.

Inclusion Criteria:

- Patients clinically diagnosed with dermatophytosis
- Age >18 years
- History of topical steroid use
- Willingness to give informed consent

Exclusion Criteria

- Patients with other dermatological conditions mimicking dermatophytosis
- Immunocompromised patients

Data Collection: A semi-structured data collection form is used. Informed consent was obtained prior to inclusion in the study from the participants. Patient's demographic data was noted. Detail clinical and dermatological examination was done and findings recorded. Fungal confirmation will be done via KOH mount. Risk factor evaluation was done by collecting data on patterns of steroid misuse and various factors responsible. Data on patterns of steroid misuse includes potency (Potent (Clobetasol/Betamethasone), Moderate (Mometasone, Fluticasone), and Fixed dose combination (FDC) with anitfungal, duration of steroid use, frequency of use and source of steroid

(Pharmacist (OTC), Friends/relatives and Previous prescription reuse). Data on risk factors include easy over-the-counter availability, lack of awareness/misconception, influence of non-medical advice, previous experience with quick relief and financial constraints (self-medication). Dermatological quality of life index (DLQI) scores were used to assess quality of life. DLQI scores were recorded and patients were categorized as 0–1 (No effect), 2–5 (Small effect), 6–10 (Moderate effect), 11–20 (Very large effect) and 21–30 (Extremely large effect).

Data Analysis:

Data analysis was done using SPSS version 22. Continuous variables will be expressed as mean ± SD or median [IQR]. Categorical variables (e.g. gender, DLQI scores categories, patterns of steroid misuse frequency) will be summarized as percentages. Association between patterns of steroid miuse and atypical morphology was tested via non-parametric tests. Multivariate logistic regression may be employed to identify independent risk factors for steroid misuse and high DLQI. P <0.05 was considered as statistical significance.

Results: A Sample of 70 patients was, involved in the study with mean± SD of age being 31.5 ± 8.9 years. Majority were males (62.9%) followed by females (37.1%). The mean duration of disease was 6.8 ± 3.2 months. Clinical presentation was in the form of extensive tinea corporis/cruris (20/28.6%), tinea corporis with atrophy (18/25.7%), tinea incognito (15/21.4%), erythematous scaly plaques with pustules (9/12.9%), steroid-induced rosacea-like lesions (5/7.1%), striae and hypopigmentation (3/4.3%). (table 1)

Table 1. Clinical presentation of steroid-modified dermatophytosis (n=70)

Morphology	n	%
Extensive tinea corporis/cruris	20	28.6
Tinea corporis with atrophy	18	25.7
Tinea incognito	15	21.4
Erythematous scaly plaques with pustules	9	12.9
Steroid-induced rosacea-like lesions	5	7.1
Striae and hypopigmentation	3	4.3

Potent steroid were misused by 60% and moderate potent by 25.7% and FDC with atifungal by 14.3%. Duration of use was 1-3months in 24(34.3%) patients, 3-6months in 20 (28.6%), >6m in 16(22.9%) and <1year in 10 (14.3%) patients. Frequency of usage in majority was >=2 times/day (n=37/52.9%), followed by Once/day (n=28/40.0 %) and <1 time/day (n=5 /7.1%). (table 2)

Table 2. Patterns of steroid use (n=70)

A) Potency	Frequency (n)	Percentage (%)
Potent (Clobetasol/Betamethasone)	42	60.0
Moderate (Mometasone, Fluticasone)	18	25.7
Fixed dose combination with antifungal (FDC)	10	14.3
B) Duration		
1-3 months	24	34.3
3-6 months	20	28.6
>6 months	16	22.9
>1 year	10	14.3
C) Frequency		
>=2 times/day	37	52.9
Once/day	28	40.0
<1 time/day	5	7.1
D) Source		
OTC pharmacist	32	45.7
Friends/relatives	18	25.7
Reuse treatment advised	12	17.1
Quack	8	11.4

Main risk factors associated with steroid misuse identified were OTC availability (45.7%) and lack of awareness (37.1%). (table 3)

Table 3. Risk factors associated with steroid misuse (n=70)

Risk factor	n (%)
Easy over-the-counter availability	32 (45.7)
Lack of awareness/misconception	26 (37.1)
Influence of non-medical advice	20 (28.6)
Previous experience with quick relief	18 (25.7)
Financial constraints (self-medication)	14 (20.0)

Majority of patients (60%) reported very large to extremely large effect on quality of life.(table 4)

Table 4. DLQI score distribution (n=70)

DLQI category	n	%
21-30 (Extremely	12	17.1

large)		
11-20 (Very large)	30	42.9
6-10 (Moderate)	18	25.7
2-5 (Small)	8	11.4
0-1 (No effect)	2	2.9

More frequent use of steroids was significantly associated with chronic and atypical morphology ($p<0.05$).(table 5)

Table 5. Atypical morphology vs patterns of misuse (Chi-square)

Atypical morphology	Non Potent	Potent	Chi-square	df	p value
Yes	10	10	1.166, 1,	1	0.280
No	18	32			
Total	28	42			
Atypical morphology	Duration < 3 months	Duration > 3 months	0.41, 1,	1	0.5204
Yes	8	12			
No	16	34			
Total	24	46			
Atypical morphology	Frequency of use <2 times/day	Frequency of use >=2 times/day	6.91,1,0.008	1	0.008
Yes	17	30			
No	16	7			
Total	33	37			

Age with adjusted OR_adj = 1.08, p = 0.0245 is a significant predictor, thus older age is associated with higher DLQI. Gender (Female vs Male) with OR_adj = 1.2, p = 0.762 → not significant. Potent steroid: OR_adj = 1.39, p = 0.5965 → not significant. Duration of steroid misuse: OR_adj = 1.8, p = 0.3094 → not significant. Frequency of usage : OR_adj = 2.84, p = 0.064 → trend but not statistically significant. Source of steroid – OTC: OR_adj = 1.61, p = 0.4095 → not significant. Lack of awareness: OR_adj = 0.39, p = 0.111 → not significant. Non-medical advice: OR_adj = 0.44, p = 0.1947 → not significant. (shown in table 5)

Table 6. Predictors of High DLQI

Predictor	Unadjusted OR	p-value	Adjusted OR	p-value
Age	1.06	0.0414	1.08	0.0245
Gender (Female vs Male)	0.9	0.84	1.2	0.762
Potent	0.95	0.9207	1.39	0.5965
Duration	1.78	0.2432	1.8	0.3094
Frequency	2.51	0.0659	2.84	0.064
Source_OTC	1.21	0.6953	1.61	0.4095
RF_Lack of Awareness	0.52	0.1917	0.39	0.111
RF_Non Medical Advice	0.56	0.2827	0.44	0.1947

Gender (Female vs Male): OR_adj = 0.26, p = 0.0137 → female gender less likely to be associated with severe misuse (significant). Other predictors (age, OTC source, awareness, non-medical advice, quick relief, financial) – none reached significance (all p > 0.1). (table 6)

Table 7. Predictors of Severe Misuse

Predictor	Unadjusted OR	p-value	Adjusted OR	p-value
Age	1.01	0.7022	1.0	0.9543
Gender (Female vs Male)	0.26	0.0102	0.26	0.0137
Source_OTC	0.94	0.9003	0.78	0.6569
RF_Lack of Awareness	2.26	0.1079	2.39	0.1203
RF_Non Medical Advice	1.63	0.359	1.76	0.3324
RF_Quick Relief	1.18	0.7632	0.83	0.7702
RF_Financial	0.74	0.6282	0.82	0.7724

Discussion: A cross sectional study on patients with steroid misuse and dermatophytosis was undertaken in 70 patients. Majority were males (62.9%) with mean± SD of age being 31.5 ± 8.9 years.

Quality of Life (QoL) Impairment

In the present study, the majority of patients (60%) experienced a *very large to extremely large* impact on quality of life (DLQI ≥11), with a mean DLQI comparable to previous Indian reports. Similar findings were observed by Meena et al., where the mean DLQI was 14.44 ± 7.29 in males and 15.78 ± 6.26 in females, highlighting the substantial psychosocial and functional impairment associated

with dermatophytosis, particularly when complicated by steroid misuse [6]. Study by Doshi et al and colleagues showed DLQI scores (mean DLQI 10.6 with SD 6.4) which falls in moderate to severe range, indicating that chronicity and misuse impairs QOL [7]. Similarly in study by Dogra et al and his colleagues stated that mean of DLQI of 13.4 with SD 7.3 thus a significant impact in patients is stated [8], which was similar to findings by Karthikeyan et al, and his colleagues with similar maximum DLQI scores and chronic and multiple site presenation of the disease.

Clinical presentation in this study was in the form of extensive tinea corporis/cruris (20/28.6%), tinea corporis with atrophy (18/25.7%), tinea incognito (15/21.4%), erythematous scaly plaques with pustules (9/12.9%), steroid-induced rosacea-like lesions (5/7.1%), striae and hypopigmentation (3/4.3%). These atypical morphologies were more associated with chronic and potent steroid use (≥2/day, p = 0.008). Similar statement was given by Verma and Vasani et al on steroid modified dermatophytosis. [10]. Also in study by Panda et al and Signh et al, chronic and inadvertent use of patent steroids resulted in atypical dermatophytosis [11, 12].

More frequent use of steroids (>= 2 times /day) was significantly associated with chronic and atypical morphology ($p<0.05$), where potent steroids clobetasol and mometasone in 60% patients. Similar observations were done by Poudyal et al. from Nepal, also by Bhatia et al[13,14]. Recently pharmacovigilance done by Dey et al, noted more than 50% atypical presentations were due to OTC availability and steroid misuse [15]. This shows the need to minimise indiscriminate use and easy accessibility of OTC of potent steroids .

In this study main risk factors associated with steroid misuse identified were OTC availability (45.7%) and lack of awareness (37.1%). Similar dfindings were seen in study by Meena and colleagues [7]. Influence of non-medical advice in 20 (28.6%) patients, previous experience with quick relief in 18 (25.7%) patients and financial constraints (self-medication) in 14 (20.0%) patients which was also seen in other studies by Dougra et al and Poudyal et al [8,13]. Study by Lathiri et al, stated that cosmetic use of steroids and community reliance on unprofessional healers led to illogical practices [16].

Multivariate regression analysis showed age as an independent predictor of higher DLQI with odds ratio = 1.08, with p= 0.025 in this study, similarly in study by Karthikeyan et al. and Dogra et al., who also mentioned that higer age is associated with atypical presentation [8,9]. Our study showed gender disparity (Female vs Male): OR_adj = 0.26, p = 0.0137 → female gender less likely to be associated with severe misuse (significant), but studies by showed gender-specific misuse patterns where men were more likely to engage in self-medication, possibly due to occupational factors and greater likelihood of unsupervised purchases [17,18,19], which needs further research.

Conclusions:

Thus more frequent use of steroids was significantly associated with chronic and atypical morphology, main risk factors associated with steroid misuse were OTC availability (45.7%) and lack of awareness Multivariate regression analysis showed higher age as an independent predictor of higher DLQI with odds ratio = 1.08, with p= 0.025 and also female gender less likely to be associated with severe misuse

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