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Irrational and Erroneous Use of Harmful Topical and Systemic Agents in the Treatment of 'Superficial Fungal Infection' in Bangladesh: A Cross-Sectional Study

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***Detailed author information and related declarations are provided in the final section of this article.*

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ABSTRACT

Background: Superficial fungal infections (SFI) are the most common dermatological diseases worldwide, with a prevalence rate of 20%–25%. Topical antifungals are effective in circumscribed areas of the skin surface. Some topical antifungals exhibit anti-inflammatory and antibacterial effects as well as antifungal activity, and are indicated for infections with inflammation and potential bacterial infection. Topical corticosteroid should be avoided as it may lead to suppression of signs of infection.

Objective: To find out the medication used by the patients with SFI before consulting a dermatologist.

Materials and method: This study was conducted in the department of Dermatology of Noakhali Medical College, Bangladesh. During the period of August'22 to September'22. The study was approved by ethical committee of the same institute. Patients' permission was taken. Patients' particulars and drug history were noted in a data collection sheet. 29 patients were purposively selected from a private chamber of a dermatologist in a rural setting.

Result: The mean ±SD age of the patients was 34.34±13.17 years (1 to 55 years). Males were 12(41.38%). Among the participants 27 (93.1%) patients took both oral and topical medication and only 2(6.9%) patients took only oral medication. Three (10.34%) patients took systemic steroid: betamethasone 0.5mg by 1(3.45%) patient, deflazacort 6mg by 1(3.45%) patient and dexamethasone 0.5mg by 1(3.45%) patient. Fluconazole, itraconazole, terbinafine and voriconazole were taken by 5(17.24%), 8(27.58%), 8(27.58%), and 3(10.34%) patients respectively. Regarding topical agents, 16(55.17%) patients used antifungal + steroid, 3(10.34%) antifungal+ antibiotic + steroid, 3(10.34%) steroid + antibiotic, 16(55.17%) used only antifungal, 3(10.34%) used only antibiotic, 7(25.92%) used miscellaneous agents having no antifungal activity.

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Conclusion: Patients with SFI use different systemic and topical medications before attending a dermatologist. Some of those medicine have no indication for SFI, some cause acute irritant contact dermatitis and use of topical steroids suppresses the disease temporarily which makes diagnosis delay.

Keywords: Irrational topical medication, topical and systemic steroid, superficial fungal infection.

Introduction

Superficial fungal infections (SFI) are the most common dermatological diseases worldwide, with a high prevalence mostly caused by dermatophytes, yeast, and to a lesser extent, non-dermatophyte filamentous fungi (NDFF). [1] The prevalence rate of SFI worldwide has been found to be 20%–25%. [2]. Dermatophyte fungi invade the keratinized tissue such as the skin (epidermis) and its appendages. In this group, pathogenic species are anthropophilic, zoophilic, and geophilic fungi belonging to three genera: Trichophyton, Microsporum, and Epidermophyton; their new classification is as follow: Trichophyton, Epidermophyton, Nannizzia, Paraphyton, Lophophyton, Microsporum,and Arth roderma [3]. Besides dermatophytes, SFI are often caused by yeasts groups mostly belonging to the genus Candida, especially C. albicans [4]. Dermatophyte species are transmitted through exposure by direct contact with the soil, animal, and infected person. [5]. The most clinical manifestations include tinea capitis, tinea corporis, tinea pedis, tinea unguium, and tinea faciei. [6]. Treatment for superficial fungal infections varies widely. Antifungal medications that are used typically belong to the azole or allylamine drug classes. [7]. Topical antifungals are effective in circumscribed areas of the skin surface. Some topical antifungals exhibit anti-inflammatory and antibacterial effects as well as antifungal activity, and are indicated for infections with inflammation and potential bacterial infection. Available oral antifungals include griseofulvin, terbinafine, itraconazole, fluconazole, albaconazole, and ketoconazole. These agents are indicated in severe or widespread infection as well as for immunocompromised patients where a prompt, thorough resolution of infection is necessary. They can also be used as an alternative to daily topical therapy.. [7]. Topical terbinafine, butenafine, econazole, miconazole, ketoconazole, clotrimazole, and ciclopirox are FDA-approved treatments. [7].

Topical formulations may be used for infections in smaller areas (e.g., sulconazole, oxiconazole, miconazole, clotrimazole, econazole, ketoconazole. [8]. Oral therapy may be required when large areas are involved, or when infection is chronic or recurrent. Topical corticosteroid should be avoided as it may lead to suppression of signs of infection [8]. Oral itraconazole, terbinafine, and fluconazole have been used successfully for tinea corporis/cruris, although none of these agents are currently approved by the FDA for use in these indications.

These oral agents are preferred over ketoconazole, due to the potential for severe hepatic side effects. Griseofulvin is not recommended as it does not adequately bind the keratin in the stratum corneum, reducing efficacy [8]. Tinea faciei is typically cleared with topical treatment. Topical ciclopirox and terbinafine may provide good anti-inflammatory effects as well as antifungal activity.[9]. Azoles may also be effective. Azoles should be used for 3–4 weeks, or at least 1 week after resolution of lesions. Resistant lesions, cases of extensive disease, or more severe cases may require oral therapy [9].

Topical corticosteroid should be avoided as it may lead to suppression of signs of infection. Anecdotal reports from dermatologists found that some topical agents containing dithranol, boric acid, coal tar and salicylic acid are used by some patients which cause acute irritant contact dermatitis making the situation worsen.

Objective: To find out the medication used by the patients with superficial fungal infection before consulting a dermatologist.

Materials and method: This study was conducted in the department of Dermatology of Noakhali Medical College, Bangladesh during the period of August'22 to September'22. The study was approved by ethical committee of the same institute. Patients' permission was taken. Patients' age and gender and drugs used before attending to a dermatologist were noted in a data collection sheet. 29 patients were purposively selected from a private chamber of a dermatologist in a rural setting during the study period. Diagnosis was done clinically by an expert dermatologist.

Result: The mean ±SD age of the patients was 34.34±13.17 years (range from 1 to 55 years). Males were 12(41.38%) and female were 17(58.62%). The following topical and systemic drugs were used by the patients before consulting a dermatologist. Patients used different medications at different time by suggestion of different medical professionals. So the summation of percentage will make more than 100%. Among the participants 27 (93.1%) patients took both oral and topical medication and only 2(6.9%) patients took only oral medication. Three (10.34%) patients took systemic steroid: betamethasone 0.5mg by 1(3.45%) patient, deflazacort 6mg by 1(3.45%) patient and dexamethasone 0.5mg by 1(3.45%) patient. Fluconazole, itraconazole, terbinafine and voriconazole were taken by 5(17.24%), 8(27.58%), 8(27.58%), and 3(10.34%) patients respectively. Regarding topical agents, 16(55.17%) patients used antifungal + steroid, 3(10.34%) antifungal+ antibiotic + steroid, 3(10.34%) steroid + antibiotic, 16(55.17%) used only antifungal, 3(10.34%) used only antibiotic, 7(25.92%) used miscellaneous agents having no antifungal activity.

Table I: Topical medication used by the patients (n=27)

Sl no	Combination of medication	No of patients	%

1	Econazole Nitrate (1%) + Triamcinolone Acetonide (0.1%)	13	44.8
2	Clotrimazole (1%) + Betamethasone Valerate (0.1%)	1	3.45
3	Miconazole Nitrate (2%) + Mometasone Furoate (0.1%)	1	3.45
4	Miconazole Nitrate (2%) + Hydrocortisone (1%)	1	3.45
5	Boric Acid (2%) + Dithranol (0.1%) + Salicylic Acid (1%)	3	10.4
6	Salicylic Acid (1.15%) + Dithranol (1.15%) + Coal Tar (5.3%)	2	6.9
7	Betamethasone Valerate (0.1%)	4	13.8
8	Clobetasol Propionate (0.05%)	3	10.4
9	Fluocinolone Acetonide (0.1%)	1	3.45
10	Betamethasone Valerate (0.1%)+ Neomycin Sulphate (0.5%)	1	3.45
11	Ciclopirox Olamine (0.77% or 1%)	3	10.4
12	Sertaconazole Nitrate (2%)	3	10.4
13	Terbinafine Hydrochloride (1%)	3	10.4
14	Clotrimazole (1%)	2	6.9
15	Luliconazole (1%)	2	6.9
16	Naftifine Hydrochloride (1%)	3	10.4
17	Fusidic Acid (2%)	1	3.45
18	Fusidic Acid (2%) + Hydrocortisone Acetate (1%)	1	3.45
19	Fusidic Acid (2%) + Betamethasone Valerate (0.1%)	1	3.45
20	Mupirocin (2%)	2	6.9
21	Clobetasol Propionate (0.05%) + Salicylic Acid (3%)	2	6.9
22	Clobetasol Propionate (0.05%) + Ofloxacin (0.75%) + Ornidazole (2%) + Terbinafine Hydrochloride (1%)	3	10.4

Table I shows the topical medication used by the patients. It was found that Econazole Nitrate (1%) + Triamcinolone Acetonide (0.1%) was used by 13 (44.83%), Clotrimazole (1%) + Betamethasone Valerate (0.1%) by 1(3.45%), Miconazole Nitrate (2%) + Mometasone Furoate (0.1%) by 1(3.45%), Miconazole Nitrate (2%) + Hydrocortisone (1%) by 1(3.45%), Boric Acid (2%) + Dithranol (0.1%) + Salicylic Acid (1%) by 3(10.35%), Salicylic Acid (1.15%) + Dithranol (1.15%) + Coal Tar (5.3%) by 2(6.9%), Betamethasone Valerate (0.1%) by 4(13.8%), Clobetasol Propionate (0.05%) by 3(10.35%), Fluocinolone Acetonide (0.1%) by 1(3.45%), Betamethasone Valerate (0.1%)+ Neomycin Sulphate (0.5%) by 1(3.45%), Ciclopirox Olamine (0.77% or 1%) by 3(10.35%), Sertaconazole Nitrate (2%) by 3(10.35%), Terbinafine Hydrochloride (1%) by 3(10.35%), Clotrimazole (1%) by2(6.9%), Luliconazole (1%) by 4(13.8%), Naftifine Hydrochloride (1%) by 3(10.35%), Fusidic Acid by

1(3.45%), Fusidic Acid + Hydrocortisone by1(3.45%), Fusidic Acid (2%) + Betamethasone Valerate (0.1%) by 1(3.45%), Mupirocin (2%) by 2(6.9%), Clobetasol Propionate (0.05%) + Salicylic Acid (3%) by 2(6.9%), Clobetasol Propionate (0.05%) + Ofloxacin (0.75%) + Ornidazole (2%) + Terbinafine Hydrochloride (1%) by 3(10.35%) patients.

Table II: Number of topical agents taken by each patient.

Sl no	Number of topical agents	No of patients	%
1	9	1	3.45
2	8	2	6.9
3	7	1	3.45
4	6	2	6.9
5	4	3	10.35
6	3	9	31.05
7	2	6	20.7
8	1	3	10.35

Table II shows that nine topical agents were used by 1(3.45%) patient, 8 agents by 2(6.9%), 7 agents by 1(3.45%), 6 agents by 2(6.9%), 4 agents by 3(10.35%), 3 agents by 9(31.05%), 2 agents by 6(20.70%) and 1 agent by 3(10.35%) patients.

Discussion:

This phenomenon, known as tinea incognito, occurs when conditions like ringworm or athlete's foot become more extensive and atypical-looking after steroid application [10]. Common topical steroids that may cause this include hydrocortisone, triamcinolone, betamethasone, and clobetasol. If you suspect a fungal infection, it's best to avoid steroids completely until the infection is properly diagnosed and treated with antifungal medications like clotrimazole, miconazole, or terbinafine. The use of topical corticosteroids can increase susceptibility to bacterial and fungal infections, and therefore may preclude them from use when infection is the known cause of the disease [11].

This study found that topical corticosteroids suppress the signs of the infection and makes diagnosis delay. So they should be avoided. [8.] In the present study we have found that only 6.9% patients used only topical antifungal medication and rest of the patients used combination of antifungal and/or topical steroid, antibiotic and some medications which have no indication for SFI. Medication like Boric Acid, Dithranol, Salicylic Acid and Coal tar cause acute irritant contact dermatitis. Topical ciclopirox and terbinafine may be used for anti-inflammatory effects as well as antifungal activity [.9]. So topical corticosteroid, dithranol, boric acid, coal tar and salicylic acid should be avoided in SFI., otherwise they may increase the sufferings of the patients. The study had the following

limitations: the sample size was small and the study was conducted in one center. So the result of the study cannot be generalized for the whole country situation. A multicentric nationwide study with large sample size should be conducted to get real picture of the whole country.

Conclusion: Patients suffering from superficial fungal infection use different systemic and topical medications before attending a dermatologist. Some of those drugs have no indication for SFI and some causes acute irritant contact dermatitis. Use of topical steroids suppresses the disease temporarily which makes diagnosis delay. Inadequate dose and duration of correct drug may cause recurrence of the disease. So, patients should consult a dermatologist as soon as SFI is noticed in any part of the body.

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