

Profile of Dermatophytosis among Armed Forces Personnel Attending in Combined Military Hospital, Dhaka

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Abstract

Introduction: Dermatophytes are by far the most significant fungi because of their widespread involvement of population at large and their prevalence all over the world. They are assuming greater significance both in developed and developing countries. Hot and humid climate in the tropical and subtropical countries like Bangladesh makes dermatophytosis a very common superficial fungal skin infection.

Objectives: To identify the pattern as well as the aetiological agents of dermatophytosis.

Methods: It was a cross sectional study conducted at Dermatology department of CMH, Dhaka. A total 100 patients were recruited through systematic random sampling and examined for cutaneous changes. Skin, nail and hair specimens were taken from the patients and processed by potassium hydroxide preparation (KOH) for direct microscopy and culture.

Results: Dermatophytosis was more common in the age group of 21-30 years (28%) and in males (64%). Most of the patients belonged to low socio-economic status (85%). Fungi was demonstrated in 74 cases (74%) either by KOH and/or culture. Dermatophytosis was more common in military persons (39%). Most common clinical type was tinea corporis (45%) followed by tinea cruris (19%). Most common aetiological agent was *T. rubrum* (62.7%) followed by *T. mentagrophyte* (25.42%), *M. gypseum* (5.08%), *T. tonsurans* (5.08%) and *E. floccosum* (1.69%).

Conclusion: Oral Acyclovir therapy begun within 24 hours of onset of symptoms has been shown to reduce the duration of lesions, pyrexia and overall disease duration. So, Acyclovir should be considered for persons at increased risk of severe Varicella infections.

Key words: Dermatophytosis, Tineacorporis, Tineacruis, *E. floccosum*, *T. rubrum*, *T. mentagrophyte*, *M. gypseum*, *Trichophyton tonsurans*.

Introduction

Superficial fungal infections are the most common skin diseases, affecting millions of people throughout the world¹. The dermatophytes are by far the most significant fungi because of their widespread involvement of population at large and their prevalence all over the world². The estimated lifetime risk of acquiring a dermatophyte infection is between 10 and 20 percent¹. Dermatophytes are keratinophilic fungi, all of which produce keratinases, that cause infections of the skin, hair and nails called "dermatophytosis" or "ring worms"³. These infections generally remain limited to non-living keratinized layers, but the infection may proceed more deeply than for the superficial mycoses, and a variety of pathologic changes can occur depending on the fungus, the site of infection, and the immune status of the host. Depending on their habitat, dermatophytes are described as anthropophilic (human), zoophilic (animal) or geophilic (soil). Anthropophilic dermatophytes are the most common sources of tinea infections. Dermatophytes are assuming greater significance both in developed and developing countries particularly due to the advent of immunosuppressive drugs and disease⁴. Hot and humid climate in tropical and subtropical countries like Bangladesh and India makes dermatophytosis a very common superficial fungal skin infection and poses a major public health problem and also is of cosmetic importance⁵. So, the study was aimed at to see the profile of dermatophytosis among armed forces personnel attending in Combined Military Hospital, Dhaka Cantonment.

Materials and Methods

This cross-sectional study was carried out in the department of Dermatology and Venereology, CMH, Dhaka from July 2019 to June 2020. Total 100 patients visiting indoor and outdoor of Dermatology and Venereology department and referred patients to Dermatology department of CMH, Dhaka were enrolled in this study. Samples were selected purposively following the inclusion criterias. Patients of all age group, both sex and those were willing to participate in this study were included. Patients with active malignancy, pregnancy and those who

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already receiving anti-fungal therapy were excluded from this study. Data were collected using a structured questionnaire (research instrument) containing all the variables of interest from the samples those who fulfilled the selection criteria by history physical examination. The diagnosis was made on clinical basis, relevant physical examinations and biochemical laboratory tests. Then specimen were collected for microscopic examination and culture sensitivity test following appropriate methods and techniques. Data analysis was performed by statistical package of social science (SPSS) version 20. Statistical analysis was done by using appropriate procedures like chi-square (χ^2) test, relative risk (RR) measurement, t test and proportion (d) test. Level of significance (p value) was set at 0.05 and confidence interval at 95%. Results were presented in tables and figures.

Results

A total of 100 patients were enrolled in this study between range 2-70 years. Mean age group affected was 21-30 years with 28(28%) followed by 31-40 years with 18(18%) and 41-50 years with 16(16%). Least common age group affected was 61-70 years with 5(5%) followed by 51-60 years with 6(6%).

Table-I: Age and sex wise distribution in relation to clinical types

Clinical types	Age Group (in years)						Sex		Total	%	
	≤10	11-20	21-30	31-40	41-50	51-60	61-70	Male			Female
Tineacorporis	5(11.11%)	7(15.56%)	14(31.11%)	6(13.33%)	8(17.78%)	3(6.67%)	2(4.44%)	34(75.56%)	11(24.44%)	45	45
Tineacurris	-	4(21.05%)	-	4(21.05%)	5(26.32%)	4(21.05%)	1(2.22%)	10(52.63%)	9(47.37%)	19	19
Tineaunguium	-	2(11.76%)	-	4(23.53%)	3(17.65%)	-	2(11.76%)	10(58.82%)	7(41.18%)	17	17
Tineacapitis	5(83.33%)	1(16.67%)	-	-	-	-	-	5(83.33%)	1(16.67%)	6	6
Tineapedis	1(50%)	-	-	-	1(50%)	-	-	0	2(100%)	2	2
Tineafaciei	2(100%)	-	-	-	-	-	-	0	2(100%)	2	2
Tineamanuum	-	-	1(100%)	-	-	-	-	1(100%)	0	1	1
Tineacorporis with Tineacurris	-	-	2(25%)	4(50%)	-	2(50%)	-	4(50%)	4(50%)	8	8
Total	13(13%)	14(14%)	28(28%)	18(18%)	16(16%)	6(6%)	5(5%)	64(64%)	36(36%)	100	100

Table-I showing age and sex distribution in relation to the clinical types of dermatophytes.

Table-II: Various clinical types in relation to occupation

Clinical Types	Occupation					Total
	Military Persons	Housewives	Students	Other Professional	Misc	
Tineacorporis	18(40%)	8(17.78%)	11(24.44%)	5(11.11%)	3(6.67)	4(45%0
Tineacurris	7(36.84%)	8(42.11%)	4(21.05%)	-	-	19(19%)
Tineaunguium	8(47.06%)	7(41.18%)	1(5.88%)	1(5.88%)	-	17(17%)
Tineacapitis	-	-	4(66.67%)	-	2(33.33%)	6(6%)
Tineapedis	-	1(50%)	1(50%)	-	-	2(2%)
Tineafaciei	-	-	2(100%)	-	-	2(2%)
Tineamanuum	1(100%)	-	-	-	-	1(1%)
Tineacorporis with Tineacurris	5(6.25%)	3(37.5%)	-	-	-	8(8%)
Total	39(39%)	27(27%)	23(23%)	6(6%0	5(5%)	-

Table-II Showing various clinical types of dermatophytes in relation to occupation of the participants.

Table-III: KOH and culture findings

	Total KOH and/or culture positive	KOH +ve Culture +ve	KOH +ve Culture -ve	KOH -ve Culture +ve	KOH -ve Culture -ve
Number of cases (%)	74(74%)	57(57%)	15(15%)	2(2%)	26(26%)

Table-III showing KOH and culture findings of various types of dermatophytes.

Table-IV: Dermatophytes isolated in relation to clinical types

Clinical Type	n	Tinea Rubrum	Tinea Mentagrophytes	Tinea Gypseum	Tunea Tonsurans	Epidermophyton Floccosum	Total Isolated
Tineacorporis	45	18(66.67%)	6(22.22%)	3(11.11%)	-	-	27(60%)
Tineacurris	19	8(66.67%)	3(25%)	-	-	1(8.33%)	12(63.16%)
Tineaunguium	17	3(60%)	2(40%)	-	-	-	5(29.41%)
Tineacapitis	6	-	-	-	3(100%)	-	3(50%)
Tineapedis	2	1(100%)	-	-	-	-	1(50%)
Tineafaciei	2	1(100%)	-	-	-	-	2(100%)
Tineamanuum	1	1(100%)	-	-	-	-	1(100%)
Tineacorporis with Tineacurris	8	4(50%)	4(50%)	-	-	-	8(100%)
Total	100	37(62.71%)	15(25.42%)	3(5.08%)	3(5.08%)	1(1.69%)	59(59)%

Table-IV showing dermatophytes isolated in relation to various clinical types.

Discussion

Dermatophytosis are major public health problem and widely distributed all over the world. The pattern of dermatophytes varies depends on several factors, such as life style, type of the population, migration of people and climatic conditions⁶. The data obtained in this study showed that highest number of patients were in the age group between 21-30 years (28%) and 31-40 years (18%). This may be due to more physical activities of the patients at this age group. Our observation coincided with Nahar A et al, 2009, Rajshahi, Rahim MR et al, 2012, Dhaka and Monoar S et al, 2015, Mymensingh⁷⁻⁹. However, some study shows patient with age group 40-59 years were more affected due to trauma, more work activity and venous insufficiency in older age¹⁰.

In the present study, out of 100 cases males 64(64%) were more commonly affected than females 36(36%). Male to female ratio 1.78:1 this is comparable with other studies¹¹⁻¹³. The highest incidence in male may be due to increased outdoor physical activities, increase sweating and increased opportunity for exposure (training, sporting etc)¹⁴. However, some studies showed that female were more prone to developed fungal infection than male. Among the various occupational groups, military persons were more sufferers (39%) followed by housewives (27%). This may be due to more physical training activities and wet work which provides favorable condition for fungal infection. Some investigators studies correlated with the results of the present study^{15,16}.

Regarding the incidence of different clinical varieties of the diseases, tinea corporis was the highest in prevalence (45%), followed by tinea cruris (19%) and tinea unguium (17%). Our results are in conformity with the results of some workers^{6,7}. It is due to increased sweating and may be poor personal hygiene. Sweating is an important factor for the development dermatomycoses. Ghosh⁵ found that due to sweating female patients suffer more than the male patients. These observations are correlated with study. The present study showed that the patients who wash their clothes every day and bed-sheets once in every 7 days are less sufferer from dermatophytoses than the patients who wash their belongings not properly.

In the present study, out of 100 clinically diagnosed cases of dermatophytosis, 74 cases (74%) were positive for fungi, either by KOH and/or culture. Fifty seven cases (57%) were positive by both KOH and culture, 15 cases (15%) were positive by KOH and negative by culture, 2 cases (2%) were negative by KOH but culture positive, 26 cases (26%) were negative by both KOH and culture. There is a difference between KOH positivity

rate and culture positivity rate i.e. fungal elements were seen under direct microscopy but samples failed to grow on culture which might be due to various factors like usage of topical corticosteroids, unsatisfactory collection of samples containing dead fungal hyphae^{12,14}.

The data obtained in this study showed that *T. rubrum* 37(62.71%) was the commonest aetiological agent in majority of clinical types followed by *T. mentagrophytes* 15(25.42%), *M. gypseum* 3(5.08%), *T. tonsurans* 3(5.08%) and *E. floccosum* 1(1.69%). In tinea capitis, *T. tonsurans* was isolated in all the 3 cases (5.08%). In the present study, *T. tonsurans* was isolated in all the three cases of tinea capitis (100%) as the commonest aetiological agent of tinea capitis.

Conclusion

The prevalence of dermatophytosis is high among individuals in Bangladesh armed forces personnel. On the bases of above studies it can be concluded that hot humid climate, excessive sweating, low socioeconomic condition, unawareness about the diseases and lack of personal hygiene are to be considered as major precipitating factors for the present rising trend of fungal diseases particularly dermatophytoses. The study also revealed that, better nutrition; increased awareness and improved hygiene may be effective for the prevention of the fungal diseases. However, detailed study may be needed for this purpose.

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