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Epidemiology and Clinical Characteristics of Dermatophytosis in The Southern Region of Bangladesh: A Cross-sectional Study

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Abstract

Background and objective: The dermatophytoses constitute a group of superficial fungal infections of keratinized tissues, namely, the epidermis, hair, and nails. The distribution and frequency of dermatophytosis vary according to the geographic region studied. The present study was undertaken to assess the clinical and epidemiological profile of dermatophytic infections in the Southern region of Bangladesh. **Methods:** A cross-sectional study was conducted from July 2024 to December 2024 in the outpatient department (OPD) of skin and venereal diseases (Skin & VD) at Gazi Medical College Hospital (GMCH), Khulna, and three private practice chambers in Khulna, Narail and Gopalganj districts. A total of 370 patients of all age groups and both genders were included in the study. Data regarding demographics and clinical types were recorded and analyzed. **Results:** Among the total 370 dermatophytosis cases, there were 174 males and 196 females. The majority of the respondents belonged to the age groups of 16-30 years and 31-40 years, each consisting of 121 (32.7%) patients. A positive family history was found in 70.5% of cases. Tinea corporis (28.6%) was the prominent clinical type of single-site infection. Among the multiple-site infection cases, T. corporis with T. cruris was the most frequent (85.6%). **Conclusion:** This study provides key information regarding the epidemiological pattern of dermatophytosis. The concerned sectors need to build awareness in the population regarding dermatophytosis so as to minimize the disease burden in society.

Keywords: Epidemiology, Clinical characteristics, Dermatophytosis.

Introduction

Superficial fungal infections are among the most frequent forms of human infection, being estimated to affect about 20-25% of the global population.[1] Dermatophyte infections (ringworm or tinea) are caused by a group of keratinophilic fungi known as dermatophytes (meaning skin plants), which invade dead keratinised layers of skin, hair and nail. They include three genera: Trichophyton, Microsporum, and Epidermophyton.[2]

The prevalence of dermatophyte infections varies from place to place, depending on the geographical location and climatic conditions.[3] Although considered a trivial disease, the psychological effects of Dermatophytoses are quite high, possibly due to the stigma attached, cosmetic involvement, chronicity, and being costly to treat.[4] Despite being a common disease, dermatophyte infections can be difficult to identify, possibly due to misuse of over-the-counter topical corticosteroids, which can mask the actual appearance of the lesions.[5] The southern region of Bangladesh, including Khulna, Gopalganj, and Narail, has a warm and humid climate. Therefore, the population of these areas is quite vulnerable to dermatophyte infections. The present study was undertaken to provide insightful information regarding the epidemiology and clinical pattern of Dermatophytosis in this region.

Materials and methods

Selection of patients

This cross-sectional study was conducted from July 2024 to December 2024 on 370 patients affected with dermatophytosis visiting the OPD of skin and venereal diseases Skin & VD at GMCH, Khulna, and three

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practice chambers in Khulna, Narail and Gopalganj districts. The study subjects were selected by a consecutive type of non-probability sampling. All patients of either sex and all age groups diagnosed with dermatophytosis (both old and new cases) who were willing to participate in the study were included. Patients having other coexisting skin diseases like eczema, superficial bacterial infection, etc., were excluded from the study.

Sample size calculation

Sample size calculation:

To determine the sample size of the cross-sectional study, the following formula was used:

$n = z^2pq/d^2$

Here, n = Desired sample size

z = Standard normal deviation, set at 1.96, corresponding with a 95% confidence interval.

P = Prevalence; according to a previous study, the prevalence of dermatophytosis was 38.8%.[6]

q = (100-p) = (100-38.8) = 61.2

d = Allowable error, set at 5%

So, $n = \{(1.96)^2 \times 38.8 \times 61.2\} \div (5)^2 = 364.9 \approx 370$

Total sample size = 370

Ethical consideration

Ethical clearance was obtained from the Institutional Ethical Review Board (IERB) of Gazi Medical College before the start of the study. The aims and objectives of the study were explained to the patients in an easily understandable local language, and informed consent was taken from each patient. It was assured that all information and records would be kept confidential. Patients who did not consent to participate in the study were assured of being given the same quality of care.

Data collection

After getting proper consent, data were collected by face-to-face conversation based on the questionnaire and the doctor's prescription form. The data collection form contained patients' demographic information, clinical types of dermatophytosis, and types of antifungal agents used for treatment.

Data analysis

All filled-up forms were verified after data collection. The data were analyzed with a computer using LibreOffice Calc Spreadsheet (version 25.2 for Windows) and Jamovi Open Statistical Software (version 2.6.26 for Windows). Quantitative data were expressed by mean ± standard deviation (SD); qualitative data were expressed by frequency tables and graphs.

Results

This study was conducted on 370 patients who were clinically diagnosed with dermatophytosis. Their demographic characteristics, occupation, family history of dermatophytosis and history of recurrence are described below and presented in Table 01.

Among the study subjects, 174 (47.0%) were male and 196 (53.0%) were female. The mean age of the patients was 33.4±15.7 years. The majority of the respondents belonged to the age groups of 16-30 years and 31-40 years, each consisting of 121 (32.7%) patients. Among the study subjects, 197 (53.2%) came from rural areas and 173 (46.8%) came from urban areas. Also, most of the patients [223 (60.3%)] came from middle-class families.

In this study, 261 (70.5%) patients had a positive family history of dermatophytosis. The great majority of the cases were recurrent [330 (89.2%)], whereas only a few cases had been newly diagnosed [40 (10.8%)].

Most of the respondents were housewives [139 (37.6%)]; the next majority were students [105 (28.4%)]. A few patients [15 (4.1%] did not have any occupation due to their younger age.

Table 01: Demographic characteristics, family history, history of recurrence, and occupational distribution of the study subjects

Demographic characteristics	Patients (n=370)
Gender	
Male	174 (47.0%)
Female	196 (53.0%)
Age group (in years)	33.4 ± 15.7 *
Less than 16	45 (12.2%)
16-30	121 (32.7%)
31-45	121 (32.7%)
46-60	67 (18.1%)
More than 60	16 (4.3%)
Locality	
Rural	197 (53.2%)
Urban	173 (46.8%)
Socioeconomic condition	
Lower class	119 (32.2%)
Middle class	223 (60.3%)
Upper class	28 (7.6%)
Family history of dermatophytosis	
Positive	261 (70.5%)
Negative	109 (29.5%)
History of recurrence	
Recurrent cases	330 (89.2%)
New cases	40 (10.8%)

Occupation	
No occupation	15 (4.1%)
Student	105 (28.4%)
Housewife	139 (37.6%)
Service holder	43 (11.6%)
Farmer	44 (11.9%)
Businessman	17 (4.6%)
Day laborer	7 (1.9%)

Table 02 shows the history of steroid use for dermatophytosis by the patients. Clobetasol was the most commonly used steroid [112 (30.3%)], followed closely by Triamcinolone [107 (28.9%)]. It also shows that 39 (10.5%) patients did not use any kind of steroid previously.

Table 02: Previous record of steroid use by the patients

Type of steroid	Frequency (%)
No history of steroid use	39 (10.5%)
Clobetasol	112 (30.3%)
Triamcinolone	107 (28.9%)
Betamethasone	68 (18.4%)
Hydrocortisone	41 (11.1%)
Prednisolone	3 (0.8%)

Figure 01 depicts the clinical types of dermatophytosis. The majority [125 (33.8%)] of the cases were affected with infection in multiple sites of their body. Among the patients suffering from single-site infection, T. corporis was the most prevalent [106 (28.6%)], followed by T. cruris [82 (22.2%)]. The rest of the clinical types were: T. pedis [14 (3.8%)], T. capitis [15 (4.1%)], T. unguium [11 (3.0%)], T. faciei [9 (2.4%)], and T. manuum [8 (2.2%)].

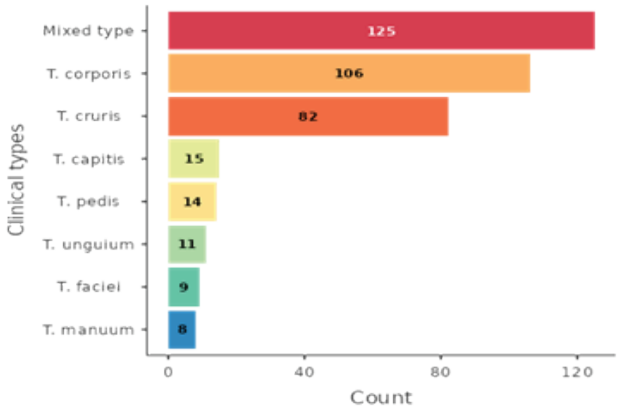

Figure 01: Clinical types of dermatophytosis

Table 03 shows the mixed types of clinical infection that were evident in 125 patients. Among them, 107 (85.6%) had (T. corporis + T. cruris) infection.

Mixed clinical types	Frequency (%) [n=125]
T. corporis + T. cruris	107 (85.6%)
T. corporis + T. faciei	11 (8.8%)
T. corporis + T. pedis	7 (5.6%)

Discussion

As one of the most common skin conditions, dermatophytosis is widespread globally.[7] Diagnosing dermatophytosis can sometimes be challenging based solely on clinical signs, as its presentation may mimic various other skin disorders. Moreover, diagnosing dermatophytosis becomes more difficult in immunocompromised patients due to its frequent atypical presentation.[8]

This cross-sectional study was conducted on 370 patients affected with dermatophytosis visiting the outpatient department (OPD) of Skin & VD at GMCH, Khulna, and three private practice chambers in Khulna, Narail and Gopalganj districts. Females were found to be affected more (53.0%) with dermatophytosis than males (47.0%). This differs from the findings of other re-searchers from different countries that showed a male preponderance.[9-11] Most of the patients in the present study were in the age group of 16-30 and 31-45 years (32.7% in each group). This finding is in accordance with the results of another study in Bangladesh.[6]

In the present study, most of the patients (60.3%) came from middle-class families, followed by lower-class families (32.2%). Only 7.6% patients came from upper-class families. In their study, Ranganathan et al.[12] reported that 69.2% of infected people were from the low-income group, followed by the middle-income group (23.3%) and the moderately rich group (1.8%). Factors such as overcrowding, inadequate hygiene, shared clothing, insufficient nutrition, and limited sanitation education prevalent among patients from low socioeconomic backgrounds may contribute to the proliferation of dermatophytes. The lesser incidence in the lower income class in our study may be due to the nonreporting of that population to the hospitals or private chambers.

In this study, 70.5% patients had a positive family history of dermatophytosis. Also, the great majority of the cases were recurrent (89.2%), whereas only a few cases had been newly diagnosed (10.8%). Some other studies showed variations in the family history of

dermatophytosis (16-20%).[2,13] History of contact with infected family members, overcrowding and sharing of clothes and towels are important factors in the household transmission of dermatophytes.

Most of the respondents from this study were housewives (37.6%); the next largest group was students (28.4%). In another study, the maximum number of patients belonged to the student category (48.90%), followed by homemakers (29%).[14] Parvathy G et al. also showed that most of the patients with fungal infections were students, followed by homeworkers (housewives and retired persons).[15]

Regarding the history of steroid use for dermatophytosis by the patients in our study, Clobetasol was the most commonly used steroid (30.3%), followed closely by Triamcinolone (28.9%). It was also found that 10.5% patients did not use any kind of steroid previously. Another study showed somewhat similar results where the most common steroid agent used was clobetasol propionate (47.91%), followed by betamethasone (17.89%) and beclomethasone (12.92%).[16] Panda and Verma[17], in their editorial, discussed the putative role of topical steroid misuse behind the sudden outbreak of the complicated, atypical, chronic, recalcitrant dermatophytosis, and the need to generate country-specific evidence. The easy availability of steroids at pharmacies across the country without any valid prescription is further compounding this problem of abuse.

Considering the clinical types of dermatophytosis in the present study, the majority (33.8%) of the cases were affected with infection in multiple sites of their body. Among the patients suffer-ing from single-site infection, T. corporis was the most prevalent (28.6%), followed by T. cruris (22.2%). The rest of the clinical types were: T. pedis (3.8%), T. capitis (4.1%), T. unguium (3.0%), T. faciei (2.4%), and T. manuum (2.2%). These findings are quite similar to the study conducted by Basak et al.,1 who reported that Tinea corporis (52.65%) was the most common clinical presentation, followed by Tinea unguium (14.1%) and Tinea cruris (12%). Another study also found that the most common clinical presentation was Tinea corporis (31%), followed by Tinea unguium (21%). High rates of Tinea corporis could be attributed to its symptomatic nature (pruritus), which leads the patient to seek medical advice.[18]

In the present study, multiple-site infection was evident in 125 (33.8%) patients. Among them, T. corporis with T. cruris was found in 85.6% cases, followed by T. corporis with T. faciei (8.8%), and T. corporis with T. pedis (5.6%). Noronha et al. also reported that tinea corporis with tinea cruris was the commonest type (35.3%), followed by tinea corporis with tinea cruris with tinea faciei (9.8%). The increased prevalence of multiple site involvement observed in their study was due to associated systemic diseases such as diabetes mellitus and HIV/AIDS, along with poor hygiene and delay in seeking treatment.[2]

Conclusion

The present study highlights dermatophytosis as a common yet important superficial fungal infection affecting people of all age groups. The disease commonly affects people who are involved in outdoor activities or who have occupational exposure and reside in an unhygienic environment. There is a need for awareness of hygienic practices and also early reporting to the physicians so as to prevent and trim down the spread of infection. Clinicians should be aware of the demographic outline of the population affected by dermatophytosis, which can ultimately help in effectively curtailing its occurrence and social burden.

Conflict of interest: None declared.

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