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Examination of the skin's superficial dermatophytic infection pattern

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Abstract

Introduction and Objectives: Dermatophytosis continues to be a serious problem for public health. The most common fungal skin infections, known as dermatophytes, impact a significant proportion of the world's population. The objective of this investigation was to examine skin infections caused by superficial dermatophytes in relation to specific demographic factors.

Materials and Methods: The cross-sectional investigation was carried out from January 2016 to December 2016 of that year. The study was conducted at the Department of General Medicine, Sree Lakshmi Narayan Institute of Medical Sciences, Puducherry, India. 100 consecutive patients will have their superficial dermatophytic infections described clinically and microbiologically.

Results: According to the report, housewives and students made up the majority of patients. Four percent of the patients were farmers. Ninety percent of our institution's student body, which included dental, medical, and nursing students, lived in the dorms. The spread of infectious pathogens through inanimate items could be the source of this. Apart from students, the remaining population is made up of people living in rural areas, including illiterate people from low-income families who are unaware of the illness. Lesions started to emerge in different places as a result of their treatment lessness and disregard for the early symptoms.

Conclusion: Students made up the bulk of our patients, with housewives and farmers making up the next group at 4%. Ninety percent of our students in dentistry, medicine, and nursing were hostellers. It might be fomites sharing here. The remainder, excluding students, consists of low-income rural illiterates and those who are ignorant about the illness.

Keywords: Dermatophytosis, skin, superficial, dermatophytic infections, microbiologically

Introduction

A class of pathogenic fungus known as dermatophytes mostly affect humans and other mammals by causing surface illnesses. Tineas are the conditions brought on by dermatophyte infections. The term "tinnitus" refers to dermatophyte infections of the feet, "genital tinea," "corporis" to the torso, and "capitis" to the head. These diseases are further classified according to where they occur on the body. Humans can contract at least 40 different types of dermatophytes, and many of these fungus can infect multiple body parts. Trichophyton tonsurans and Microsporum canis continue to be the most common causes of tinea capitis and tinea pedis, respectively [1].

Dermatophytes are septate-hyphaed ascomycetes that belong to the Onygenales family and are most closely linked to Coccidioides immitis. Dermatophytes are classified into three genera: Microsporum, Epidermophyton, and Trichophyton. Despite the fact that the species were once categorized into these genera based on their morphology and physical characteristics, rRNA sequencing study has shown that the dermatophytes are a single, cohesive group and that there is no discernible difference between the three genera [2]. Two Trichophyton species may be the closest relatives of any one Microsporum species. Therefore, the rRNA-based phylogenetic tree should always be used when making comparisons across genera [3].

The global distribution of superficial fungal infections is influenced by a number of environmental factors, including climate, location, lifestyle, participation in outdoor activities, socioeconomic position, and others. In India, the incidence was higher among men. Depending on the species, strain, inoculum size, afflicted regions, and the immune status of the individual, the clinical presentation may vary.

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Poverty, overcrowding, and poor personal cleanliness are risk factors for dermatophytosis. The type and frequency of dermatophytosis may also change over time due to alterations in living standards and preventative efforts such good personal cleanliness [4].

Tinea cruris is a fungal infection that appears to be most common in the perianal and groin areas of persons worldwide. Its pandemic proportions are attributed to a number of factors, including extremely high humidity rates, overpopulation, and unhygienic living conditions. Dermatophytes only affect the skin's outermost layer. The inflammatory reaction is mediated by both the dermis and the malpighian layers of the epidermis; however, the fungus is only found to be growing in the stratum corneum of the epidermis. The disease can be transmitted by direct contact with ill individuals, animals, dirt, contaminated clothing, or shoes. The following list of clinical symptoms is categorized by the infection site: Tineabarbae, Tineafaciei, Tinea cruris, Tinea manuum, Tinea pedis, and Tinea capitis (scalp, eyebrow, and eyelash). The illness may impact each of these regions. Based on their morphology, they are divided into three main taxa [5].

Treatment delays are a result of using home remedies and traditional medicine, which hastens the progression of illness. The pattern of appearance altered by the indiscriminate use of antifungal medications and other topical therapies makes it more challenging to diagnose and cure fungal infections. Thus, an early and accurate diagnosis is essential to deliver antifungal medications promptly. This study of fungal infection patterns can shed light on an appropriate diagnosis and treatment plan [6]. Examining demographic factors in relation to the frequency of superficial dermatophytic skin infections was the aim of this study.

Materials and Methods

The cross-sectional investigation was carried out from January 2016 to December 2016 of that year. The study was conducted at the Department of General Medicine, Sree Lakshi Narayan Institute of Medical Sciences, Puducherry, India. 100 consecutive patients will have their superficial dermatophytic infections described clinically and microbiologically.

Inclusion Criteria

- Patients with clinical features suggestive of a superficial dermatophytic infection;
- Patients older than five years of age

Exclusion Criteria

- People recently prescribed systemic or topical antifungal medication;
- Patients undergoing prolonged antibiotic and immunosuppressive therapy

Statistical analysis

Two numbers and a percentage were used to display the data. SPSS version 16.0 was utilized for data analysis. The Student t test was utilized in order to determine statistical significance between the groups. When the p-value is less than 0.05, statistical significance is indicated by a 95% confidence interval.

Results

In this study, there were more female participants than male. Fifty-five percent of the patients were female. Fifty-five percent of the patients were male. The study's participants were primarily between the ages of 10 and 20, with lesser proportions belonging to the 2-30 and 31-40 age groups, respectively. Individuals between the ages of 61 and 70 were the least likely to be affected.

Table 1: Patient distribution by occupation

Sr. No.	Occupation	Patients	%
1.	Farmer	3	3.00
2.	Coolie	9	9.0
3.	Student	51	51.0
4.	Housewives	24	24.0
5.	Professional	11	11.0
6.	Business	2	2.0
	Total	100	100.00

The bulk of our research participants were housewives, although the largest patient group consisted of students. 9% of patients were Coolie employees. There were just 3.0% subsistence farmers.

Table 2: Examining patient distribution according to educational attainment

Sr. No.	Educational status	Patients	%
1.	Illiterate	27	27.0
2.	Undergraduate	69	69.0
3.	Postgraduate	4	4.0
	Total	100	100.00

In this study, students made up the bulk of patients; only 4% were postgraduates and 27% were illiterate.

Table 3: Patient allocation based on monthly income

Monthly income in Rupees	Patients	%
No income	68	38.0
In100s	21	21.0
In1000s	11	11.0
Total	100	100.00

Most of our patients were classified as "no income category" in our study since they were either stay-at-home moms or students.

Table 4: Patients' distribution based on residential location

Sr. No.	Monthly income	Patients	%
1.	Urban	30	30.00
2.	Rural	70	70.00
	Total	100	100.00

Approximately 75% of the patients included in this study were from rural areas.

Table 5: Itching is a major complaint, according to patient distribution.

Sr. No.	Itching	Patients	%
1.	Yes	100	100.00
2.	No	00	00.00
	Total	100	100.00

Itching was experienced by every single patient in our study.

Table 6: Patient distribution according to length of lesion, itchiness, and main complaint

Sr. No.	Duration of itching and lesion	Number	%
1.	1-7 days	15	15.0
2.	One month	20	20.0
3.	Above one month	65	65.0
	Total	100	100.00

Twenty percent of our patients experienced itching lasting longer than a week, fifteen percent had lesions that lasted longer than a month, and sixty-five percent had lesions that lasted longer than a week.

Table 7: Patients' categorization based on medical records

Sr. No.	Past history	Patients	%
1.	No	85	85.0
2.	Yes	15	15.0
	Total	100	100.00

Based on the information shown in the above table, 15.0% of patients reported having a similar symptom during the year prior.

Table 8: Patient assignment based on family members' common medical history

Sr. No.	Similar among family members	Patients	%
1.	No	65	65.0
2.	Yes	35	35.0
	Total	100	100.00

The chart indicates that 35.0% of patients had relatives who had the same symptoms at the time of their visit to our outpatient department.

Discussion

Underlying mycoses are common all over the world. It is thought that 30-35 percent of the world's people have them, and the number of people who have them is growing. There were 100 people with dermatophytosis in our study, and 65 of them were women. No matter what age, anyone can get dermatophytosis at any time. The people in our study were between the ages of 10 and 70. It can happen to people of any age^[7], but 45% of the cases were between the ages of 10 and 20^[8]. 1 in 5 cases, or 15%, were between the ages of 21 and 40. It's possible that this is because these patients are more likely to be close to other patients who are also more mobile, which makes them more likely to get sick. The age range with the most cases was 11 to 20 years old, followed by 1 to 10 years old. This is in line with past data that showed most infections happen in people under 20. Other study shows that people between the ages of 21 and 30 are most likely to be affected^[9-11]. Most of our patients were students. The next biggest group was made up of housewives and farmers. There were 90% kids from our school who were staying with us. Their majors were nursing, medicine, and dentistry. This might be the case because fomites are shared. Aside from students, the rest of the population is made up of people who live in rural areas. Most of them can't read or write and come from lower-income families. Because they didn't know what was wrong, they ignored the first sores and didn't go to the doctor, which caused more sores to appear in different places^[12]. One

reason the lesions last a long time and show up later than expected is that the patients don't want to go to the doctor, especially female patients. The amount of good past information we had was 12.17 percent. Even though it didn't happen very often, some of them did get infected again. If the treatment isn't right, the problem could come back. It's possible that the fomites spreading through the house played a role in the new illness. Since family members are sharing things like clothes, soap, towels, and other things more often^[13-15], 45.22 percent of the 100 patients said that similar problems had happened in their own family before. People who took part in the study (43.48%) were more likely to exchange dirty blankets, soaps, clothes, and shoes. About 29.56 percent of the cases had more than two fomites. These findings add to the evidence that dermatophyte diseases can be passed from one person to another through sharing household items and bugs. A total of 99.13% of the patients took showers every day, and 28.7% of those people used the shared pool. Because of this, campaigns to teach people about the risks of swimming in public pools must be the top concern^[16-18].

Eighty-eight percent of people who answered this survey said they had never had a pet, but 19% said they had had a dog in the past. One study from 1995 by Chander Grover *et al.* found that only 14% of patients said they had pets or often dealt with animals. 96 A few of the patients were more used to seeing pets like dogs, cats, and cows. The most common diagnosis in this study was tinea corporis, and 44.35 percent of the patients had sores in more than one place. In 27.83% of cases, sores were seen in the groyne. Skin lesions showed up on the back and lower limbs in 4.35 percent of people on average. 3.48 percent of people at each place had sores in their buttocks and axilla. 14% of the tumors were in the area below the breasts, the belly, the waist, and the face. 1.74 percent of the time, the injuries were only on the upper limbs^[19-21].

Most of the people who were diagnosed were told they had tinea corporis. Of the 100 people who came in, 36 had tinea corporis that needed to be checked out. We saw people with tineacuris, tineamannum, and tineapedis, as well as groups of tumors that were all connected. Seventy-eight percent of the 117 people who took part in this study had tinea corporis and eighteen percent had tinea cruris. Most of the time, *T. rubrum* was the cause in 45 of these cases. Tinea corporis was seen in 31.4% of cases, making it the second most common clinical diagnosis after tinea capitis. The number of cases of tinea cruris in this study was 21.74 percent. Groyne and waist infections are more likely to happen when you wear clothes that are too tight and cause you to sweat a lot, swell, and not breathe well^[21, 22].

It was found that tinea corporis and tinea cruris were more likely to last a long time and come back. 17% of the time, tinea faciei was present. Three and a half percent of people had tinea manuum and 1.74% of people had tinea pedis. A popular way to show and describe surface mycoses is to use KOH testing with direct microscopy. Even though direct microscopy is a quick and effective test, there is a 5-10% chance of getting a false negative because the KOH positive seems to be affected by where the infestation is. Microscopically good results were seen in 64.35 percent of the people in our study^[23, 24].

As an extra diagnostic tool, microbiological identification of the species causing dermatophytosis is very important when addressing superficial fungal diseases. Dermatophytes are

grown in labs in synthetic soil that has an organic nitrogen source. Agar, dextrose, and peptone are the things that are used to make Sabouraud's dextrose agar. Emmon changed the amount of sugar from 4 to 2 and raised the pH of the medium from 5.6 to 6.8-7.0. Adding one liter of chloramphenicol to this medium makes it possible to separate dermatophytes from other microbes. Culture helps us figure out what species something is. But only 45.95% of the cases in our study had scientific proof. This percentage is seen as good, which is in line with what other studies have found. Positive cultures were found in 45.3% of the patients in Calicut who were being looked at. This low number of positive cultures could be because of the pathogen's strict needs, a small sample size, or the side effects of previous treatments [25].

64.71 percent of patients tested positive for *T. rubrum*, which is the species that is most often found on cultures. The second-placed *T. mentagrophyte* had a positive test response 35.29 percent of the time. The results were the same in other studies where *T. rubrum* was the main strain. In spite of this, most research done in India showed that *Trichophyton rubrum* was the most common isolate. For example, the infection spot changed how the species was identified. It was found that *T. rubrum* was the most common organism in tinea corporis. Most cases of tinea cruris are caused by the *T. mentagrophyte* strain. In less than half of cases, a clear diagnosis can be made, even though microbiological proof is needed for diagnosis and therapy suggestions [26-29].

Conclusion

There were more women than guys in our poll. People between the ages of 10 and 20 were most often harmed. Since most of our patients are either students or stay-at-home moms, we can assume that they come from low-income families. In this study, 60.87% of patients said they had itching and sores that wouldn't go away for more than a month. 43.48 percent of patients in this study said they had ever shared their fomites. People who answered the poll (12.17% of them) said they had had a similar illness the year before. About 45.22 percent of the people who came to our outpatient department had a family background of the same problems at the time they came in. Only 0.87% of the patients in our study took a bath every other day, while 99.13% took a bath every day. The well water was used by 71.30% of patients, while the shared pool was used by only 28.70%. The study's results show that most of the patients had one of three conditions: tinea corporis, tinea cruris, or tinea pedis. It was shown in this study that having dogs at home, swimming in public pools, and sharing bed nets can all make shallow dermatophytic skin diseases spread. Further large-scale studies will be able to show this.

Funding

None

Conflict of Interest

None

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