

Cross-Sectional Study on Risk Factors Involved with Mycological Infections in and Around Indore Region

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ABSTRACT:

Background: Overcrowding, poor hygiene, low socioeconomic status, obesity, increased sweating, tight synthetic garments, occupational and recreational exposures, and associated conditions such as diabetes mellitus, cushingoid syndrome, immunosuppressive states, atopy, ichthyosis, and other skin conditions all increase the risk of dermatophytosis.

Aim: The present study aim is to determine clinical characterization, environmental factor and host factor of dermatophytes infection.

Materials & methods: After obtaining permission from the Institutional Ethics Committee the present study was conducted among patients comes in dermatology OPD, 200 dermatophytosis samples were selected taking the inclusion and exclusion criteria of the present study and were processed in mycology laboratory of Microbiology Department.

Results: The number of incidents was largest during the summer months (136), then it decreased during the wet months (44), and finally it was lowest during the winter months (20). According to our research, many instances were reported in occupations related to farmers (58), followed by people who worked outside (46), students (32), people who worked in offices (32), and those who stayed at home (32). According to the results of the Chi-square test, the p-value was 0.013, which indicates that there was a statistically significant difference.

Conclusion: Dermatophytosis can affect young and middle-aged males due to UV radiation and physical exertion-induced sweat. Hot, humid workplaces increase risk. Congestion, dirt, disease, and malnutrition affect low-income people more. *Trichophyton rubrum* causes tinea corporis and cruris. The increased family scabies-like clustering. Embarrassed and anxious women underreport. The first session helps patients prevent this uncomfortable dermatophyte disease.

Keywords: *Dermatophytosis; Overcrowding; Humid; Diabetes mellitus.*

INTRODUCTION:

Dermatophytosis is being researched to better comprehend the causes, symptoms, and treatments of this fungal infection of the skin, hair, and nails [1-5]. A common skin infection known as dermatophytosis can cause extreme discomfort and distress in its victims [4-6]. By researching the disease, researchers can learn more about its underlying causes and develop more effective treatments and dermatophytosis epidemiology can inform public health policies and actions [7,8]. Overcrowding, poor hygiene, low socioeconomic status, obesity, increased sweating, tight synthetic garments, occupational and recreational exposures, and associated conditions such as diabetes mellitus, cushingoid

syndrome, immunosuppressive states, atopy, ichthyosis, and other skin conditions all increase the risk of dermatophytosis [9,10]. Other reasons can cause dermatophytosis. Dermatophytosis can also be caused by other reasons [11-18]. Dermatophyte infections are caused by interactions between the host, the agent, and the environment [19]. Infection can be caused by diabetes, lymphomas, Cushing syndrome, and immunological deficiency. Infection is caused by weakened immunity [20]. Dermatophytes are more likely to infect the intertriginous areas when the pH is high, there is a lot of sweating, and there is a lot of maceration [21,22]. Dermatophytes are caused by bodily disorders. Dermatophyte infection is common in

intertriginous zones [23,24]. Therefore, the present study aim is to determine clinical characterization, environmental factor and host factor of dermatophytes infection.

MATERIALS AND METHODS:

Following approval from the Institutional Ethics Committee, the current study was conducted among dermatology OPD patients. 200 dermatophytosis samples were selected using the inclusion and exclusion criteria of the current study and processed in the Microbiology Department's mycology laboratory. The current research was a descriptive observational study. New patients with a clinical suspicion of dermatophytosis who attend or are referred to mycology OPD were included, as were patients of all ages, regardless of gender, and patients with co-existing systematic illness. Patients who did not offer informed consent, patients on antifungal medicine (oral and systemic), patients with additional microorganisms, fungal infections in hair, nails, and skin folds, and levanters were excluded. The protocols were followed when collecting skin scrapings, nail clippings, and epilated hair. We gathered two samples from each patient in order to perform a direct microscopic examination. The potassium hydroxide content in these samples ranged from 10% to 40%. In a sterile setting, the samples were prepared for a direct KOH mount and cultured on Sabouroud's dextrose agar with and without antibiotics, as well as Dermatophyte test medium (DTM). A mounting technique known as Lacto Phenol Cotton Blue (LPCB) was used to elucidate the hyphal morphology, conidia morphology (both microconidia and macroconidia), and conidia organization of fungal colonies that resembled mold. A biochemical reaction test for urea hydrolysis was performed using Christensen's urea medium to differentiate *T. mentagrophyte* species from *T. rubrum* species. This was accomplished using Christensen's urea medium. The hydrolysis of urea by *T. mentagrophytes* species results in a vivid rose coloration of the media. *T. rubrum*, on the other hand, is unable of hydrolyzing urea and hence has no effect on the medium's color. *T. mentagrophytes* and *T. rubrum* were differentiated from one another using a hair perforation test.

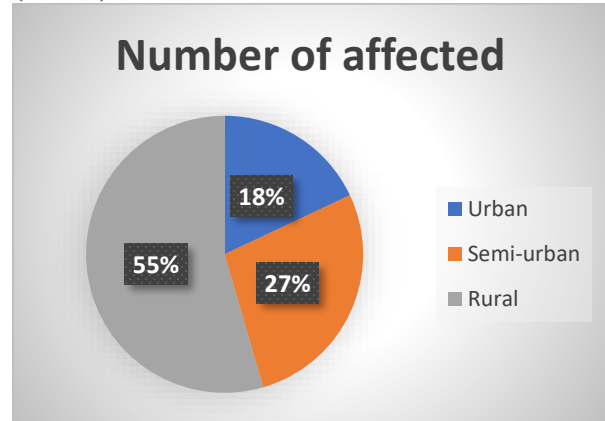
STATISTICAL ANALYSIS:

The unpaired T Test and ANOVA test were used for analysis of quantitative variables while chi-square test was used for analysis of qualitative variables. P – Value

less than 0.05 were taken as significant. SPSS 28 version software was used for all statistical calculations.

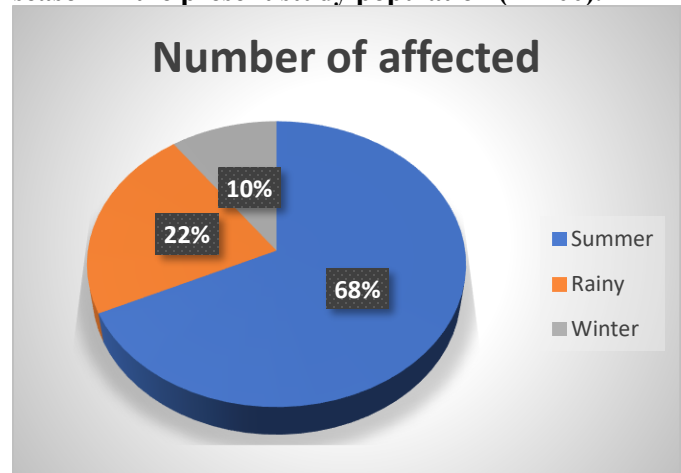
RESULTS:

Figure 1: Dermatophytosis prevalence in relation to locality of stay in the present study population (n=200).



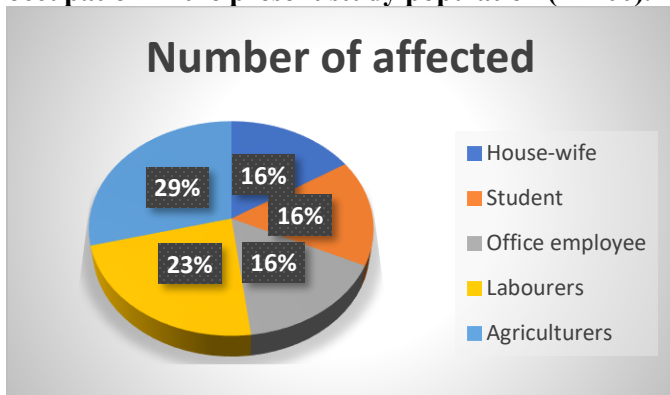
Our study found that out of 200 patients, 112 were from rural areas, 54 were from semi-urban areas, and 34 were from urban centers. The Chi-square test indicated a statistically significant difference (p-value 0.002) between the two groups.

Figure 2: Dermatophytosis prevalence in relation to season in the present study population (n=200).



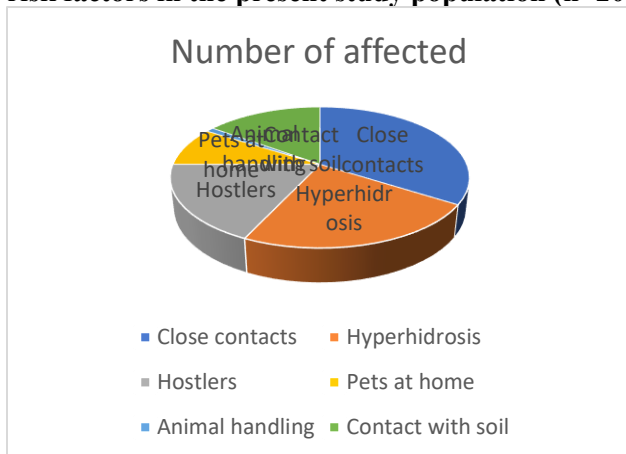
The number of incidents was largest during the summer months (136), then it decreased during the wet months (44), and finally it was lowest during the winter months (20).

Figure 3: Dermatophytosis prevalence in relation to occupation in the present study population (n=200).



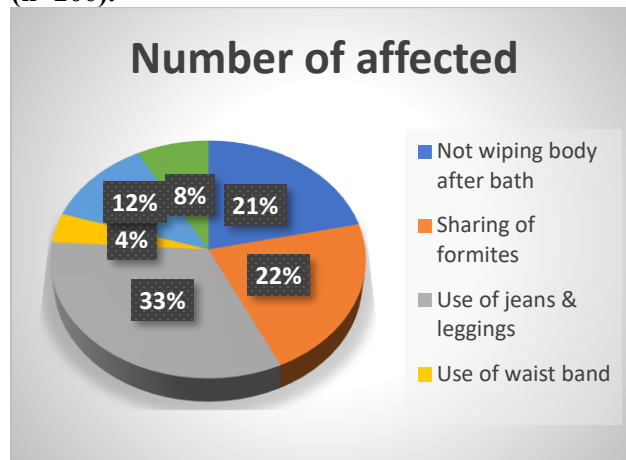
According to our research, many instances were reported in occupations related to farmers (58), followed by people who worked outside (46), students (32), people who worked in offices (32), and those who stayed at home (32). According to the results of the Chi-square test, the p-value was 0.013, which indicates that there was a statistically significant difference.

Figure 4: Dermatophytosis prevalence in relation to risk factors in the present study population (n=200).



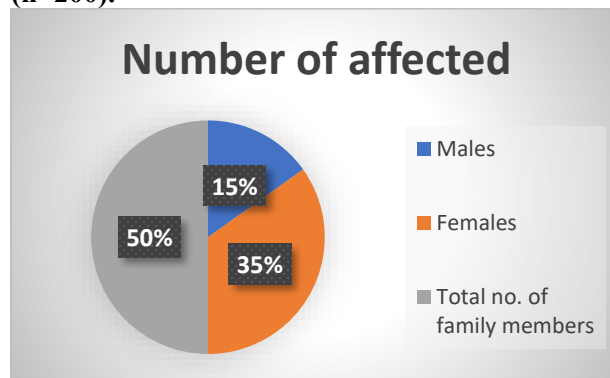
In our research, among the study population, we found that 68 patients had close family ties, which was followed by hyperhidrosis in 46 patients, hostellers in 36 patients, people who had contact with soil in 30 patients, patients who had pets in their homes in 18 patients, and two patients who had a history of working with animals.

Figure 5: Dermatophytosis prevalence in relation to personal history in the present study population (n=200).



43 patients in the study population reported a history of wearing clothes immediately after bathing without first wiping, including 14 females and 28 males; 43 patients reported a history of sharing fomites such as towels, bed linen, or dresses, including 8 females and 34 males; and 66 patients reported frequently using synthetic garments such as synthetic sarees, leggings, or jeans, including 36 females and 32 males. There was a total of 8 male patients who were using waistbands, and all of them were men. The wearing of synthetic clothes was identified as the individual risk factor that was associated with the condition in 66 cases, making it the most prevalent risk factor overall. 24 patients were seen to have a history of wearing undergarments that did not fit properly or became wet. Of these patients, 6 were females and 18 were males. Additionally, 16 patients were found to wear shoe socks, of whom 8 were females and 8 were males.

Figure 6: Dermatophytosis prevalence in relation to family history in the present study population (n=200).



In the current investigation, among the people who participated in the study, we discovered that 66 patients' relatives had also been afflicted with dermatophytosis in

some capacity. Within the overall patient pool for the study, there were a total of 20 male patients and 46 female patients.

DISCUSSION:

According to our findings, the bulk of persons involved in these circumstances came from lower socioeconomic origins (66%), followed by those from middle-class backgrounds (34%). It's probable that this happens more frequently because people don't eat well, are unaware of the disease, work in filthy settings, share feces, live in cramped quarters, come into contact with diseased animals and dirt, and sweat profusely when doing heavy physical labor outside. Furthermore, they may not exercise proper hygiene. There may be an insufficient number of people aware of the illness. These findings are consistent with previous study [20,22, 23, 24]. In those investigations, the majority of patients (63%, 67.74%, 70.5%, and 66%, respectively) were from a low socioeconomic class, followed by patients from a moderate socioeconomic position, and finally patients from a high socioeconomic status. According to the study's findings, there is a statistically significant link ($p = 0.002$) between the population size and the socioeconomic status of the area's citizens.

Our study's patients came from 112 distinct rural places, 54 different semi-urban areas, and 34 different metropolitan areas. It is probable that the disease is more prevalent in rural areas because people do not take appropriate care of themselves, do not have a high level of education, or live in congested places. According to the study's findings [21,24], the rural population accounted for 64% of the cases discovered. Another study [23] found that the sickness afflicted 80.65 percent of people living in cities but just 19.35 percent of people living in rural areas. These findings support previous research's findings. The study's findings revealed a statistically significant difference ($p = 0.001$) in the location of the participants' residences.

According to the study's findings, 136 cases of dermatophytosis occurred during the course of the summer. This was followed by the wet season, which had 44 incidents, and the winter season, which had 20 incidents. Summer months are likely to see an increase in dermatophytosis cases since the heat causes people to sweat more than usual. The oil produced by your sebaceous glands is wiped away when you sweat excessively. As a result, there is a greater chance that dermatophytes will infect your skin. These observed findings were comparable to [24], where 64% of cases were reported in the summer season, followed by rainy (28%) and winter (8%), 40% of cases were recorded in the summer [25], and contradictory to [26], where 44.37% of cases were reported in the rainy season,

followed by winter, and least by summer. [24]: 64% of cases were reported during the summer, followed by the rainy season (28%), and winter (8%).

CONCLUSION:

Dermatophytosis can affect young and middle-aged males due to UV radiation and physical exertion-induced sweat. Hot, humid workplaces increase risk. Congestion, dirt, disease, and malnutrition affect low-income people more. *Trichophyton rubrum* causes tinea corporis and cruris. The increased family scabies-like clustering. Embarrassed and anxious women underreport. The first session helps patients prevent this uncomfortable dermatophyte disease.

Conflict of interest: Nil None declared.

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