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Cross-Sectional Study On Mycological Pathogens With Comorbid Conditions In And Around Indore Region.

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Abstract:
Background: *Researchers can learn more about the disease's underlying causes and find more effective therapies by researching it, and dermatophytosis epidemiology can inform public health policies and activities.*
Aim: *The present study aim is to determine mycological pathogens with comorbid conditions in and around Indore region.*
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: *Twenty patients had diabetes mellitus, ten had hypertension, eight had both, fourteen had bronchial asthma, four had psoriasis, six had polyarthritis, and 138 had no co-morbidities. The Chi-square test showed a statistically significant p-value of 0.002.*
Conclusion: *The community has many more cases of dermatophytosis that cause recurrence and transmission. Thus, India's National Public Health Program must combat dermatophytes. Drug control laws and awareness campaigns are needed to solve this issue. Drug law violations can lead to family drug misuse and overdoses.*
Keywords: *Dermatophytosis; Pathogens; Tinea; Chi-square; Epilated hair.*

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I. Introduction:

Dermatophytosis is being studied in order to gain a better understanding of the causes, symptoms, and therapies of this fungal infection of the skin, hair, and nails [1-3]. Dermatophytosis, a common skin infection, can cause severe discomfort and misery in its patients [4]. Researchers can learn more about the disease's underlying causes and find more effective therapies by researching it, and dermatophytosis epidemiology can inform public health policies and activities [5-8].

Arthroconidia are able to attach to keratinized tissue with the help of proteases released by dermatophytes. Dermatophytes have this ability because they manufacture specific proteases. To help arthroconidia get through barriers like keratinocyte-produced sphingosines and sebaceous gland-produced fatty acids, these proteases are crucial [5,6]. After arthroconidia have germinated, hyphae development is the next stage. This growth occurs radially, and it may proceed in any number of ways. [8,9] Trichophyton mentagrophytes, on the other hand, forms carbohydrate-specific adhesins on the surface of its microconidia, but Trichophyton rubrum does not. This procedure causes Trichophyton rubrum to attach to the epithelial cells. The rate at which spores germinate and penetrate the stratum corneum is much faster than the rate at which desquamation occurs. This is greatly simplified by the metalloendoprotease (fungalysins) and serine subtilisins (fungasins) secreted by dermatophytes. Fungi produce hydrolases like lipases, ceramidase, and mucolytic enzymes, all of which aid in the invasive process [9,10]. Hydrolases are also synthesized by fungi. First, sulfitolysis must be performed in keratinized tissues to reduce the strength of disulfide bridges in those regions. Only when this is accomplished can there be any hope of penetration, and only then can the protease have access to the substrates.

Furthermore, because the sample size was so tiny, it is impossible to say with absolute certainty whether or not there was a significant shift. There was not a single correlational study that compared any of these indicators to one another in or around the region under inquiry [9-12]. In order to establish unique treatment management strategies for this illness, my research will look into the functions of variables in two participants chosen at random [13-15]. The goal of my research is to investigate the functions of variables in order to accomplish this. The present study aim is to determine mycological pathogens with comorbid conditions in and around Indore region.

II. Materials & methods:

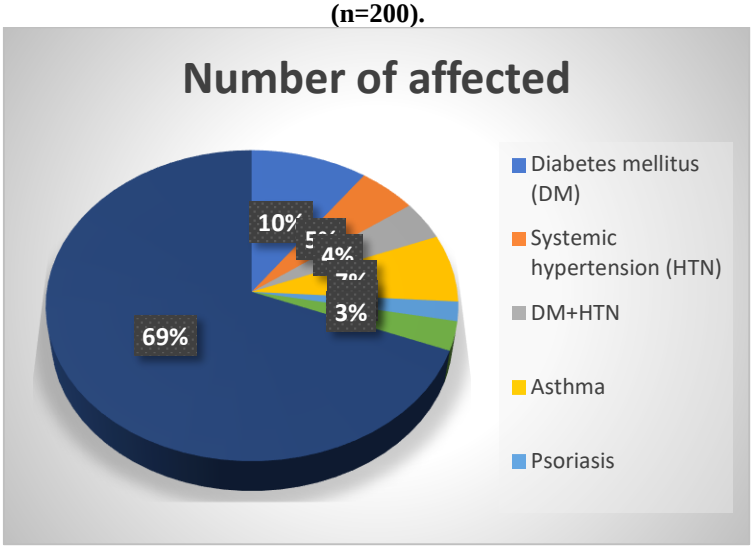
The current investigation was carried out at the outpatient department of dermatology after receiving consent from the Institutional Ethics Committee. The mycology laboratory at the Microbiology Department processed 200 dermatophytosis samples that met the study's inclusion and exclusion criteria. This investigation was an observational descriptive study. Patients of any age or gender with a clinical suspicion of dermatophytosis who present to or are referred to the mycology OPD were included, as were patients with comorbid systemic disease. Patients with extra germs, fungal infections of the hair, nails, and skin folds, and levanters were not allowed to participate. Neither were patients who refused to provide informed consent or who were already taking oral or systemic antifungal medication. Skin scrapings, nail clips, and epilated hair were collected in accordance with established procedures. For each patient, we collected two samples for microscopic analysis. These samples had a potassium hydroxide concentration of between 10% and 40%. The samples were cultivated on Sabouroud's dextrose agar with and without antibiotics, as well as Dermatophyte test medium (DTM), and then prepared for a direct KOH mount in a sterile environment. Fungal colonies resembling mold were mounted in Lacto Phenol Cotton Blue (LPCB) to better understand their hyphal morphology, conidia morphology (microconidia and macroconidia), and conidia organization. Christensen's urea medium was used in a biochemical reaction test for urea hydrolysis to distinguish T.mentagrophyte species from T.rubrum species. Christensen's urea medium was used to get this result. T. mentagrophytes species hydrolyze urea, coloring the medium a bright rose color. However, T. rubrum has no effect on the medium's color since it is incapable of hydrolyzing urea. The hair perforation test was used to distinguish between T. mentagrophytes and T. rubrum.

Statistical analysis:

For quantitative variables, we utilized the unpaired T Test and ANOVA tests, while for qualitative variables, we used the chi-square test. Significant results were defined as having a p-value of 0.05 or lower. The SPSS 28 statistical package was used for all analyses.

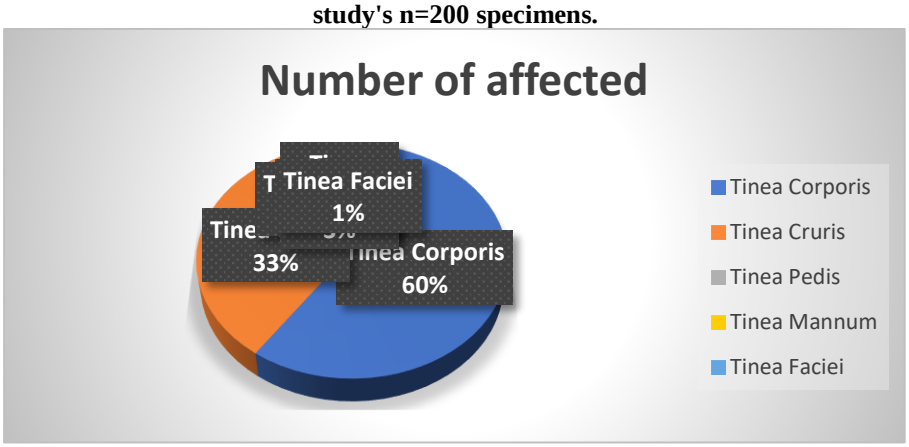
III. Results:

Figure 1: Dermatophytosis prevalence in relation to comorbid diseases in the present study population (n=200).



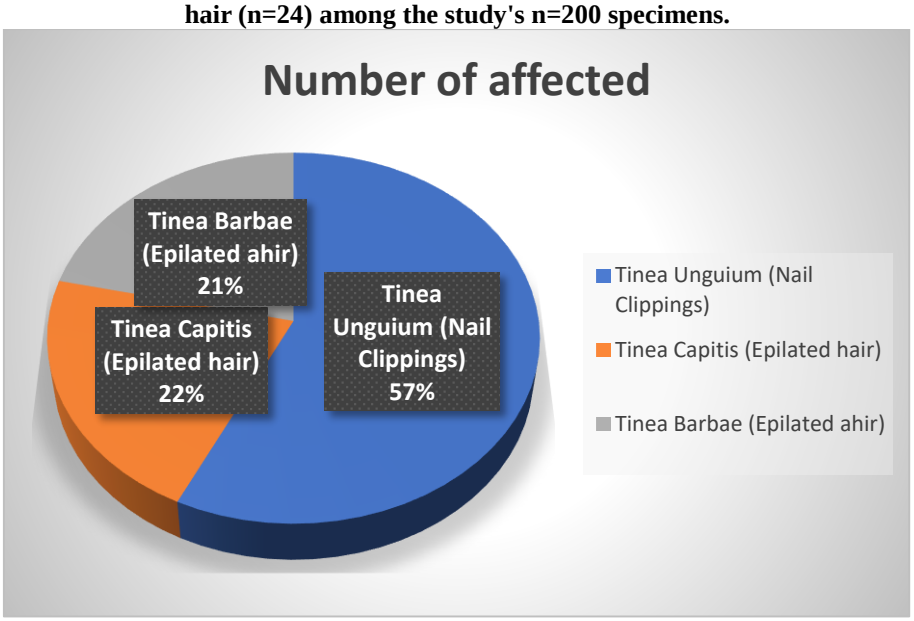
Twenty patients in the study population were diagnosed with diabetes mellitus, ten patients were diagnosed with hypertension, eight patients were diagnosed with both hypertension and diabetes mellitus, fourteen patients were diagnosed with bronchial asthma, four patients were diagnosed with psoriasis, and six patients were diagnosed with polyarthritis, and 138 patients did not have any associated co-morbid conditions. According to the results of the Chi-square test, the p-value was less than 0.002, which is statistically significant.

Figure 2: The prevalence of various pathogens of dermatophytosis in skin scrapings (n=144) among the study's n=200 specimens.



Throughout the course of our investigation, we amassed a total of 200 specimens, 144 of which were skin scrapings, 32 of which were nail clippings, and 22 of which were samples of hair that had been epilated. The results of the Chi-square test indicated that there was a statistically significant difference between the two groups, since the p-value was lower than 0.002, as required by the test. Tinea corporis was the most common type of dermatophytic lesion found in this study's 144 skin scraping specimens (n=72), accounting for 86 of the cases. Tinea cruris came in second, accounting for 48 of the cases. Both tinea pedis and tinea manuum were identified in a total of four cases. In two of the cases, tinea faciei was found. Out of the total number of epilated hair specimens (n=24), 12 came from Tinea capitis and 12 came from Tinea barbae.

Figure 3: The prevalence of various pathogens of dermatophytosis in nail clippings (n=32) and epilated hair (n=24) among the study's n=200 specimens.



IV. Discussion:

Although it is possible that the illnesses occurring at the same time are coincidental, it is also plausible that these illnesses are exacerbating the tinea infections. Diabetes mellitus was determined to be the most common relationship, which was detected in 20 participants during the course of this inquiry. This was followed by 10 patients having systemic hypertension. Psoariasis struck four patients, Diabetes Mellitus and Systemic Hypertension struck eight, and Bronchial Asthma struck four. These findings are consistent with previous research [16], which indicated that diabetes is responsible for 20% of all cases of hypertension, 16% of all cases of atopy, and 9% of all diabetes occurrences [17]. Diabetes was prevalent in 22% of study participants, high blood pressure was prevalent in 9%, dermatitis was prevalent in 2%, and HIV was prevalent in 2% [18]. The occurrence of co-morbid conditions was found to be statistically significant (p value of 0.003) in the group under consideration.

The majority of the samples used in this investigation (144) consisted of skin scrapings, while the remainder 24 were comprised of nail clippings and hair removals respectively. These findings are in line with what [19, 20] found in their studies, in which skin scrapings accounted for 54% of the study, hair samples accounted for 39% of the research, and nail fragments accounted for 7% of the research. These findings are comparable with what [19, 20] uncovered. It was found that collecting samples from members of the research group was statistically significant (p value = 0.002) in this regard.

In the course of our research, we identified 86 patients suffering from tinea dermatitis who also had tinea corporis. This was the clinical symptom of tinea dermatitis that was seen most frequently. Tinea cruris came next, affecting 48 people, then tinea manuum, which impacted four people, then tinea pedis, which impacted four people, and finally tinea faciei, which impacted only two people. Tinea cruris was shown to be more common than tinea corporis, which suggests that the symptoms of tinea corporis, specifically the itching, are what prompt people to seek medical assistance. It was found that the majority of people who had tinea sweated a lot because they worked excessively hard or spent an excessive amount of time in the sun, both of which made the condition worse.

V. Conclusion:

Beyond what we discovered as the tip of the iceberg, there are many more cases in the community that account for relapse and continuous transmission of dermatophytosis. As a result, India's National Public Health Program must address this dermatophytic problem. To address this issue, rigorous drug control legislation as well as intense awareness and communication programs are required. When drug laws are not strictly enforced, it can result in issues such as prescription drug abuse and overdoses within families.

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