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Article

Risk Factors of Superficial and Cutaneous Fungal Infections at Tertiary Care Teaching Hospital

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Abstract: Introduction: Superficial and cutaneous mycoses are fungal infections that primarily affect the outermost layers of the skin, hair, and nails. These infections are caused by a variety of fungal organisms, including dermatophytes, yeasts, and non-dermatophytid molds. While superficial mycoses are generally not life-threatening, they can cause significant morbidity, discomfort, and cosmetic concerns. This study aims to determine the prevalence and associated risk factors of superficial and cutaneous mycoses in a specific population. Material and Methods: A hospital-based cross-sectional study was conducted over one year to assess the prevalence and associated risk factors of superficial and cutaneous mycoses. The study population included patients attending dermatology outpatient clinics with suspected fungal infections of the skin, hair, and nails. A total of 120 patients were recruited using systematic random sampling. Informed consent was obtained from all participants. The study included both male and female patients across various age groups, with detailed demographic data collected through structured interviews. Results: The distribution of patients indicates that the most affected age group was 21-40 years (35%), followed by 41-60 years (32%). The prevalence was higher among males (58%) compared to females (42%), suggesting a potential occupational or lifestyle-related exposure in men. Dermatophytosis was the most prevalent type of mycosis (45%), followed by pityriasis versicolor (30%) and candidiasis (25%). Combination therapy (topical and oral antifungal treatment) had the highest response rate (85%), followed by oral antifungals alone (75%). Topical treatments alone showed the lowest efficacy (65%). Conclusion: Superficial and cutaneous mycoses remain a prevalent concern with significant risk factors. Public awareness, improved hygiene, and timely diagnosis can help in controlling the spread of these infections.

Keywords: Superficial mycoses, cutaneous mycoses, prevalence, risk factors, fungal infections, dermatophytosis.

INTRODUCTION

Superficial and cutaneous mycoses are fungal infections that primarily affect the outermost layers of the skin, hair, and nails. These infections are caused by a variety of fungal organisms, including dermatophytes, yeasts, and non-dermatophytic molds. [1] While superficial mycoses are generally not life-threatening, they can cause significant morbidity, discomfort, and cosmetic concerns. [2] Their prevalence is notably higher in tropical and subtropical regions due to favorable climatic conditions that promote fungal growth and transmission. [3]

The most common superficial mycoses include dermatophytosis (tinea infections), pityriasis versicolor, and candidiasis. Dermatophytes, which include species from the genera *Trichophyton*, *Microsporum*, and *Epidermophyton*, are the primary etiological agents of dermatophytosis. [3] These infections can be transmitted through direct contact with infected individuals, animals, or contaminated objects such as clothing, towels, and grooming tools. [4] The high transmissibility of these infections makes them a significant public health concern, particularly in overcrowded or unhygienic living conditions. [5]

Several intrinsic and extrinsic factors contribute to an individual's susceptibility to these infections. Intrinsic factors include

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age, gender, genetic predisposition, and underlying medical conditions such as diabetes mellitus and immunosuppression. [6] Extrinsic factors include environmental conditions, occupational exposure, personal hygiene practices, and the use of occlusive footwear and clothing. [7] Increased perspiration, particularly in humid environments, can create an ideal setting for fungal proliferation, further exacerbating the risk of infection. [8]

Despite the availability of a wide range of antifungal treatments, superficial and cutaneous mycoses remain a persistent problem due to high recurrence rates and the emergence of antifungal resistance. [9] Inappropriate use of antifungal medications, including self-medication with over-the-counter topical and oral agents, contributes to treatment failure and resistance. [10] Moreover, factors such as prolonged moisture retention, poor ventilation, and lack of proper hygiene continue to facilitate the spread of these infections, making their management challenging. [11]

Public health measures aimed at controlling superficial mycoses should focus on improving awareness about preventive hygiene practices, early diagnosis, and appropriate treatment. Routine screening in high-risk populations, such as athletes, military personnel, and individuals in communal living environments, can help mitigate the burden of these infections. Additionally, further research into alternative antifungal therapies and resistance mechanisms is essential to develop more effective treatment strategies. [12]

This study aims to determine the prevalence and associated risk factors of superficial and cutaneous mycoses in a specific population, highlighting key demographic and clinical factors influencing their occurrence. By understanding the epidemiological trends and risk factors, this research can contribute to developing more targeted interventions for controlling and preventing these infections.

MATERIAL AND METHODS

A hospital-based cross-sectional study was conducted over one year to assess the prevalence and associated risk factors of superficial and cutaneous mycoses. The study population included patients attending dermatology outpatient clinics with suspected fungal infections of the skin, hair, and nails.

A total of 120 patients were recruited using systematic random sampling. Informed consent was obtained from all participants. The study included both male and female patients across various age groups, with detailed demographic data collected through structured interviews.

Inclusion Criteria

- Patients of all age groups presenting with clinical symptoms of superficial and cutaneous mycoses.
- Patients willing to participate and provide informed consent.
- Individuals with a history of recurrent fungal infections.

Exclusion Criteria

- Patients on antifungal treatment for more than two weeks before the study.
- Individuals with systemic fungal infections.
- Immunocompromised patients with severe underlying conditions affecting skin pathology.

Data Collection

Demographic and clinical data were collected using a structured questionnaire. Information regarding occupation, hygiene practices, comorbidities, and lifestyle habits was recorded. Skin scrapings, nail clippings, and hair samples were obtained for laboratory analysis.

Laboratory Diagnosis

- **Direct Microscopy:** Skin, nail, and hair samples were examined using a 10% potassium hydroxide (KOH) preparation to detect fungal elements.
- **Culture:** Samples were inoculated onto Sabouraud Dextrose Agar (SDA) with and without chloramphenicol and cycloheximide to isolate dermatophytes and other fungal pathogens.
- **Identification:** Fungal isolates were identified based on colony morphology, pigment production, and microscopic examination using lactophenol cotton blue staining.

Statistical Analysis

Data were analyzed using SPSS software. Descriptive statistics, including frequency and percentage distributions, were used to summarize categorical variables. The chi-square test was applied to assess associations between fungal infections and various risk factors. Logistic regression analysis was performed to identify independent predictors of superficial and cutaneous mycoses.

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RESULTS

Table 1: Demographic Distribution of Patients

Age Group	Male (%)	Female (%)	Total (%)
0-20	10	8	18
21-40	20	15	35
41-60	18	14	32
>60	10	5	15

In table 1, the distribution of patients indicates that the most affected age group was 21-40 years (35%), followed by 41-60 years (32%). The prevalence was higher among males (58%) compared to females (42%), suggesting a potential occupational or lifestyle-related exposure in men.

Table 2: Prevalence of Different Types of Superficial Mycoses

Type of Mycosis	Cases (%)
Dermatophytosis	45
Pityriasis Versicolor	30
Candidiasis	25

In table 2, Dermatophytosis was the most prevalent type of mycosis (45%), followed by pityriasis versicolor (30%) and candidiasis (25%).

Table 3: Occupational Distribution and Mycoses Prevalence

Occupation	Cases (%)
Manual Labor	40
Office Work	30
Student	20
Others	10

Table 4: Hygiene Practices and Infection Correlation

Hygiene Level	Cases (%)
Poor	50
Average	30
Good	20

In table 4, a significant correlation was observed between poor hygiene and increased cases of superficial mycoses, with 50% of affected individuals reporting poor hygiene practices. Those with average hygiene accounted for 30% of cases, while individuals maintaining good hygiene had the lowest infection rate (20%).

Table 5: Associated Comorbidities Among Patients with Mycoses

Comorbidity	Cases (%)
Diabetes	25
Hypertension	15
None	60

In table 5, Diabetes was the most common comorbidity associated with superficial mycoses (25%), followed by hypertension (15%). However, 60% of cases had no underlying conditions.

Table 6: Diagnostic Methods and Positive Cases Identified

Method	Positive Cases (%)
Direct Microscopy	70
Fungal Culture	60

In table 6, Direct microscopy was the most effective diagnostic tool, identifying 70% of positive cases, followed closely by fungal culture at 60%.

Table 7: Treatment Modalities and Response Rate

Treatment Type	Response Rate (%)
Topical	65
Oral	75
Combination	85

In table 7, Combination therapy (topical and oral antifungal treatment) had the highest response rate (85%), followed by oral antifungals alone (75%). Topical treatments alone showed the lowest efficacy (65%).

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DISCUSSION

The findings of this study highlight the significant burden of superficial and cutaneous mycoses in the studied population. With a prevalence of 35%, these infections remain a considerable health concern, particularly in regions with warm and humid climates that favor fungal growth. The study identified multiple risk factors, including age, gender, occupational exposure, and hygiene practices, all of which contributed to increased susceptibility to these infections.

One of the major findings was the high prevalence of dermatophytosis among the study participants. Dermatophytosis, commonly referred to as ringworm, is known to be one of the most widespread superficial mycoses, particularly among individuals exposed to communal environments such as schools, workplaces, and sports facilities. [13] The increased incidence among manual laborers further emphasizes the occupational risks associated with these infections, highlighting the need for targeted preventive measures in high-risk groups. [14]

Personal hygiene was identified as a crucial determinant of mycoses occurrence, with individuals reporting poor hygiene practices showing significantly higher infection rates. This finding underscores the importance of public health education programs to promote awareness about proper skin care, hygiene maintenance, and effective strategies for preventing fungal infections. [15] Health authorities should implement community-based awareness campaigns to educate populations on avoiding risk factors and recognizing early symptoms of mycoses. [16]

The study also noted that comorbid conditions, particularly diabetes mellitus, were significantly associated with an increased risk of superficial mycoses. Diabetes is known to impair immune function and disrupt skin barrier integrity, making affected individuals more susceptible to fungal infections. [17] Given this association, healthcare providers should incorporate regular dermatological screening as part of routine medical assessments for diabetic patients. [18]

Treatment response rates varied among participants, with combination therapies of topical and oral antifungals showing the highest efficacy. However, recurrence rates remained a challenge, particularly in cases where environmental and lifestyle factors were not adequately addressed. [19] The emergence of antifungal resistance further complicates treatment strategies, necessitating continuous monitoring of drug efficacy and responsible prescribing practices to prevent resistance development. [20]

CONCLUSION

Overall, this study emphasizes the need for an integrated approach in managing superficial and cutaneous mycoses. This should involve not only clinical management but also public health interventions aimed at reducing risk factors, promoting hygiene, and enhancing community awareness. Superficial and cutaneous mycoses remain a prevalent health concern. This study highlights key risk factors associated with these infections. Timely diagnosis, targeted treatment, and preventive strategies are essential for effective management. Future efforts should focus on public education, improved hygiene, and antifungal resistance monitoring.

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