The Relationship Between Type and Position of Fungal Infection with Age and Gender

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ABSTRACT

Dermatophytosis is a superficial fungal infection caused by filamentous fungi that attack the keratinized tissue. Aimed to: the find out relationship between type and position of fungal infection with age and gender. Material and Methods: This cross-sectional survey study was carried out at the dermatology department, from August 2021 to July 2023. Results: The ages most affected by fungi were between 17 and 32 years old at 60%, followed by the oldest age over 35 years old. The females were the most infected with fungi, 93 out of 155. As for the type of infection, yeast was the highest, especially in 60 women. hyphae 28 and spores 8 where males were less infectious, the relationship between gender and fungal position, because p-value < 0.05, As for the type of fungus and its existence, it has nothing to do with gender because p-value > 0.05, it has nothing to do with gender because p-value > 0.05, and the relationship between age and presence of fungal infection, because p-value < 0.05, the type of fungus and position of fungal infection, it has nothing to do with age because p-value > 0.05. Conclusion: females are more likely to be infected with fungi, whether they are by infection type or location, and the most infected ages are between 17 and 32 years old. The study also showed that the place of infection in nails was found in males and there was no infection in females.

INTRODUCTION

Fungal infections, also known as mycoses, are prevalent across the globe and affect diverse populations, spanning various age groups and geographical regions. The prevalence of fungal infections is influenced by factors such as climate, immune status, and the presence of underlying medical conditions. In tropical and subtropical regions, where environmental conditions are conducive to fungal growth, the incidence of these infections tends to be higher (Brown et al., 2012). One of the characteristic features of fungal infections is their ability to affect different anatomical sites, including the skin, nails, respiratory tract, and internal organs. Superficial fungal infections, such as dermatophytosis and candidiasis, commonly manifest on the skin and mucous membranes. On the other hand, systemic fungal infections can be more severe and may involve vital organs, posing a significant threat to individuals with compromised immune systems (Kauffman, 2015).

The characteristics of fungal infections are also influenced by the diverse spectrum of fungal species. Candida species, Aspergillus species, and dermatophytes are among the common pathogens responsible for human fungal infections. Each species exhibits unique characteristics in terms of virulence, pathogenicity, and the clinical manifestations of the infections they cause (Pfaller et al., 2015). Host factors, such as immunodeficiency, diabetes, and the use of

immunosuppressive medications, play a crucial role in predisposing individuals to fungal infections. Patients with conditions such as HIV/AIDS or undergoing organ transplantation are particularly susceptible to opportunistic fungal pathogens. Understanding the interplay between host factors and fungal characteristics is essential for the effective prevention and management of these infections (Lionakis et al., 2018). Fungal infections, or mycoses, continue to be a significant global health concern with a prevalence that varies across diverse populations and regions. Factors such as climate, immune status, and underlying medical conditions contribute to the prevalence of fungal infections (Brown et al., 2012). As of my last knowledge update in January 2022, these factors may have evolved, and recent epidemiological studies would provide the most current insights into the prevalence of fungal infections worldwide. Characteristic features of fungal infections encompass their ability to affect various anatomical sites, including the skin, nails, respiratory tract, and internal organs.

Superficial infections like dermatophytosis and candidiasis commonly manifest on the skin and mucous membranes, while systemic infections can be more severe, impacting vital organs, especially in immunocompromised individuals. Recent developments in our understanding of the clinical characteristics and manifestations of fungal infections may have emerged since my last update in January 2022 (Kauffman, 2015). The diversity of fungal species significantly contributes to the characteristics of fungal infections. Common pathogens include Candida species, Aspergillus species, and dermatophytes, each with unique traits in terms of virulence and pathogenicity. Ongoing research may have identified new fungal species or provided additional insights into the characteristics of existing ones (Pfaller et al., 2015).

Host factors, such as immunodeficiency, diabetes, and immunosuppressive medications, remain critical in predisposing individuals to fungal infections. Patients with conditions like HIV/AIDS or undergoing organ transplantation continue to be particularly susceptible to opportunistic fungal pathogens. Advances in our understanding of host-fungal interactions and the impact of host factors on infection susceptibility may have occurred since my last update in January 2022 (Lionakis et al., 2018).

The sex of human hosts affects the incidence of some fungal infections because the immune response is sex-dependent (Kraševec, et al, 2022). Older age tend to suffer dermatophytosis compared with younger age. It also found females more frequently suffer dermatophytosis compared with male subjects (Ni Wayan Widhidewi, et al, 2023). Differences in pathogens and frequency of fungal infections between age groups should be considered for the optimal selection of the appropriate therapeutic regimen (Christian Kromer, et al, 2022), Age and gender variability in the distribution of fungal genera in this disease.(Sara Martínez-Rodrígue, et al, 2023), incidence of pityriasis versicolor infection has been significantly associated with age, area, and gender (Al-Taie, Myasar Jasim Mohammed, et al, 2022).

METHODS

This Cross-sectional survey study was carried out at the dermatology department of the Alwahda Teaching Hospital in Derna City, Libya, from August 2021 to July 2023.

Eligible Criteria
1. Patients who were diagnosed with fungal infection confirmed by laboratory results.
2. Patients aged 1 years and over.
3. all races and ethnicities are eligible for study enrolment.
4. Gender: males and females will be offered to participate in this study.

Exclusion Criteria

Unhealthy patients or fungal infections as a complicated or and the manifestation of systematic diseases.

Sample Size and Sampling Method

In this study, all eligible consecutive patients with a fungus infection were invited to take part. A total of 3980 patients visited the dermatology clinic at Alwahda Teaching Hospital during the study period for various skin issues, and 149 of them were found to have a fungal infection. They all agreed to take part in the study. Every person invited to participate must complete a questionnaire form with questions pertinent to our study. Age, gender, fungus type, and location are among the questions on this simple Arabic questionnaire. Doctors in the clinic will fill out forms with questions about the type of fungal infection and its location.

Confidentiality

All teams working on this project will handle subject records in a confidential manner. All subjects' names and other personal information will be encoded with secure numbers (which will be used to replace all subjects). The subject's identity will not be revealed; only aggregate data will be presented at professional gatherings or in publications related to this project. The study's subject files will all be kept in a safe place.

Ethical Approval

All participants were voluntary and informed about the objectives of the study and informed consent was obtained from all the participants. The study was conducted in accordance with the Declaration of Helsinki.

RESULTS AND DISCUSSION

A total of 155 patients participated in the study who met the Eligibility Criteria. Demographic profiles: as displayed in Table 1. In total, 155 patients participated in the study, with 56 (38 %) male and 96(61.9%) female (figure 1). The patients' ages ranged from one year to 79 years, with an overall mean age of 27.15 years±16.47. according to figure (2). The most prevalent type of fungal infection was yeast, which was present in 97 cases (62.6%), 44 hyphae (28.4%), and 14 spores (9.0%). according to Figure (3). Body area 110 (71.0%) had a higher prevalence of fungal infection than did the hair 42(27.1%), and nails had the lowest area 3(1.9%).

Table 1. Demographic profiles N 155 (%), Mean and Std.Deviation

Patient's profile	N 155 (%)	Mean	Std. D
Age(years)			
Mean±SD	27.15±16.47	6	16.441
Age group			
1-16	43(27.7%)		
17-32	62(40.0%)	-	-
≥33	50(32.3%)		
Gender			
Male	59(38.1%)	1.6194	0.48712
Female	96(61.9%)		
Fungal type			
Yeast	97(62.6%)		
Hyphae	44(28.4%)	1.4645	0.65740
Spore	14(9.0%)		
Position of Fungal Infection			
Body	110(71.0%)	1.3097	0.50411
Hair	42(27.1%)		
Nail	3(1.9%)		
Present of Fungal Infection			
Yes	149(96.1%)	1.0387	0.19353
No	6(3.9%)		

In Table 2 shows that there's a relationship between gender and fungal position, because the p-value < 0.05, As for the type of fungus and its existence, it has nothing to do with gender because the p-value > 0.05.

Table 2. Relationship between gender and Fungal Type, presence of fungal infection, and Location of Fungal Infection.

Correlations		Gender
Fungal Type	R	-0.012
	P-Value	0.882
Presence of Fungal Infection	R	-0.049
	P-Value	0.542
Position of Fungal Infection	R	-0.257[**]
	P-Value	0.001
	N	155

[**]. Correlation is significant at the 0.01 level (P-value).

Table 3. Percent of Male and Female

Gender	Frequency	Percent %
Male	59	38.1
Female	96	61.9
Total	155	100.0

Figure 1 illustrated that the type of infection, yeast was the highest, especially in 60,6 % of women. hyphae 28.4 % and spores 9.0 % where males were less infectious
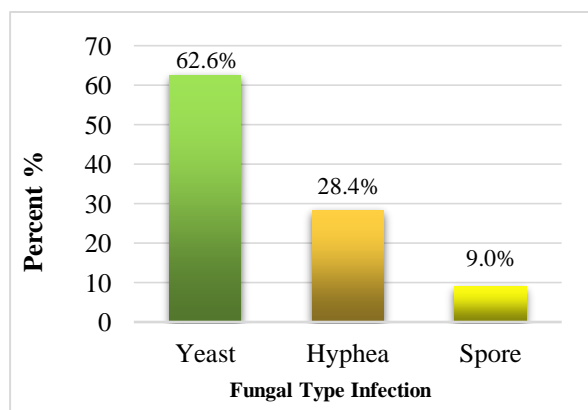

Figure 1. Percent of the type of infection

Table 4. Position of fungal infection

Location of Fungal Infection on Patient Bodies	Frequency	Percent %
Body	110	71.0
Hair	42	27.1
Nail	3	1.9
Total	155	100.0

Table 5 shows that there's a relationship between age and the presence of fungal infection, because the p-value < 0.05, As for the type of fungus and Position of Fungal Infection, it has nothing to do with age because the p-value > 0.05

Table 5. Relationship between gender and Fungal Type, Presence of Fungal Infection, and Position of Fungal Infection

Correlations		Age
Fungal Type	R	-0.131
	P-Value	0.105
Presence of Fungal Infection	R	-0.185[*]
	P-Value	0.021
Position of Fungal Infection	R	-0.119
	P-Value	0.140
	N	155

[*]. Correlation is significant at the 0.05 level (P-value).

[**]. Correlation is significant at the 0.01 level (P-Value).

Table 6 illustrated that The ages most affected by fungi were between 17 and 32 years old at 60%, followed by the oldest age over 32 years old

Table 6. The ages which infected with fungi

Presence of Fungal Infection	Age			Total
	1 - 16 years	17 - 32 Years	More than 32	
Yes	39[a]	60[a]	50[a]	149
No	4[a]	2[a]	0[a]	6
Total	43	62	50	155

Each subscript letter denotes a subset of Age categories whose column proportions do not differ significantly from each other at the .05 level.

Figure 6 illustrated that the type of infection, yeast was the highest, especially in 60 women. hyphae 28 and spores 8 where males were less infectious.
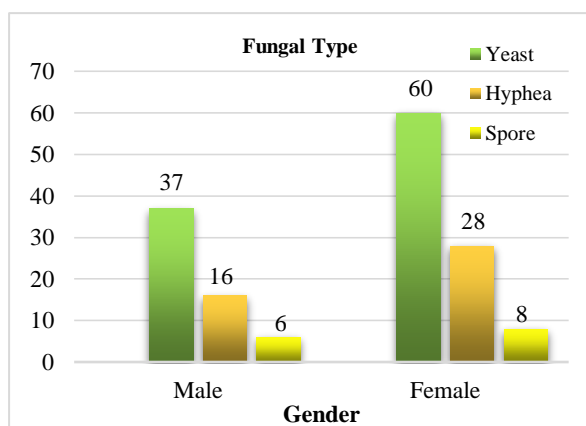
Figure 6. Relationship between type of fungal infection and gender

Risk factors for all the endemic fungi are likely largely related to underlying social determinants of health, socioeconomic, and health disparities, although immunologic mechanisms likely play a role as well, particularly in disseminated coccidioidomycosis (Jenks, J. D. 2023, In total, 155 patients participated in the study, with 56 (38 %) male and 96(61.9%) female (table 3).

The patients' ages ranged from one year to 79 years, with an overall mean age of 27.15 years±16.47. according to figure 1, the most prevalent type of fungal infection was yeast, which was present in 97 cases (62.6%), 44 hyphae (28.4%), and 14 spores (9.0%). according to (table 4) Body area 110 (71.0%) had a higher prevalence of fungal infection than did hair 42(27.1%), and nails had the lowest area 3(1.9%), The data indicate that females were more affected by fungal infection than males were, with 96(61.9%); 56 (37.6%), respectively. The ages most affected by fungi were between 17 and 32 years old at 60%, followed by the oldest age over 35 years old. The females were the most infected with fungi, 93 out of 155.

As for the type of infection, yeast was the highest, especially in 60 women. hyphae 28 and spores 8 where males were less infectious The female share was also higher in the place of infection, the body and hair in succession 76 and 20, while the syndrome infection was present in males 3 and I don't have females. In Table 2 show that there's a Relationship between gender and fungal position, because p-value < 0.05 , As for the type of fungus and its existence, it has nothing to do with gender because p-value > 0.05, Table 5, As for the type of fungus and its existence, it has nothing

to do with gender because p-value > 0.05 , and the a Relationship between age and Presence of Fungal Infection, because p-value < 0.05, As for the type of fungus and Position of Fungal Infection, it has nothing to do with age because p-value > 0.05. Table 5 illustrated that the females were the most infected with fungi, 93 out of 155. Table 6 illustrated that the ages most affected by fungi were between 17 and 32 years old at 60%, followed by the oldest age over 32 years old. Figure 6 illustrated that the type of infection, yeast was the highest, especially in 60 women. Hyphae 28 and spores 8 where males were less infectious

This study agrees with (Jenks, J. D, et al. 2023), that he says that sex and gender are the important determinations of fungal infection especially during anti-fungal treatment drug, and (Wang, X, et al, 2020) prof that the distribution of fungal species disease and pathogenic fungi varied in different gender, age and time (Kwong, K, et al, 2023), concluded that the risk factors for fungal sensitization include male, sex, teenaged, atopic dermatitis, asthma, and ecoregion,(Widhidewi, N. W, 2023) concluded that age and female tend to suffer dermatologists. Fungal infection detection and management training for healthcare personnel should be conducted, Fungal Infections among Various Age Groups a (Shailaja Rani Meda, et al, 2023).

CONCLUSION

The study showed that females are more likely to be infected with fungi, whether they are by infection type or location, and the most infected ages are between 17 and 32 years old. The study also showed that the place of infection in nails was found in males and there was no infection in females.

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