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Gender difference about superficial Fungl infections among immunocompromised patients in Dhi Qar governorate 2021-2022

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Abstract---Superficial fungal infections are caused by many fungi, which can invade various aspects of the human body which effect the skin, hair, and nails, are widely observed in the world. Causative agents are Candida species, dermatophytes, and Malassezia species. This study aims to knowledge gender difference about superficial fungal infections among immune compromised patients in Dhi Qar Governorate. A non-probability (convenience sample) of 500 sample were selected throughout the use of non-probability sampling approach. The study was conducted in six health institutions affiliated to the Dhi Qar Health Department, in addition to the medical clinics in the governorate. A questionnaire as a means for data collection, it consist of four parts include demographic data, diseases that weaken the immune system (Diabetes, cancer, leukemia, genetic blood diseases and kidney failure), locations of the superficial fungal infection and risk factors. Through questionnaire the, data were collected and analyzed through the application of descriptive and inferential statistical data analysis approach. Most of the study sample aged 44 years, 310 (62%) of them were males, 190(38%) of them were female, about 346(69.2%) of them were from urban residence, about 227(45.4%) of them were not working, most of them were married 309(61.8%). The study reviled the highest percentage 247(49.9%) was found to be among patient suffer from diabetes militias while the lowest percentage 22(4.4%) was found to be among

patient suffer from renal failure. The incidence of fungi is more in men than in women and diabetes was common risk factor for SFIs so this group have diagnostic, therapeutic and prophylactic needs in relation to fungal diseases.

Keywords---gender difference, superficial infections, immunocompromised.

Introduction

Superficial fungal infections are very common in the world that effect the nails, skin and hair. Causative agents are dermatophytes, *Candida* species and *Malassezia* species (Demirseren, 2020). Only fully keratinized tissues, such as the stratum corneum, hair, and nails, have been invaded by superficial mycoses (Gamage *et al.*, 2020). They cause a wide range of human illnesses, from superficial skin infections to invasions of interior organs (systemic disease). These infections are mainly caused by a reduction in natural human defenses (immunocompromised people) or opportunistic heavy exposure to the fungus. Despite the fact that they are rarely life threatening, they can have a detrimental effect on a person's quality of life and, in certain cases, can spread to other people or become invasive ((Narasimhalu *et al.*, 2016). Depending on the portion of the body affected and the etiological agents involved, dermatophytes infections can manifest in a variety of ways. Tinea capitis (scalp), tinea corporis (body), tinea cruris (groin), tinea pedis (foot), tinea unguium (nail), tinea manuum (hand), and tinea faciei are some of the clinical entities (face) (Ezomike *et al.*, 2021).

Superficial *Candida* infections usually caused by *Candida albicans* that is part of the normal microbiota in about 50% of individuals that colonizes the oropharyngeal cavity, gastrointestinal and vaginal tract, and healthy individuals' skin (Talapko *et al.*, 2021). *Malassezia* spp. are linked with pityriasis versicolor, seborrheic dermatitis and folliculitis (Hay, 2013). Geographical location, cultural background, and population migration patterns all have an impact on the characteristics and prevalence of SFIs in different areas. Climate (humidity, temperature), lifestyle (e.g., attending public swimming pools), and participation in outdoor activities have all been linked to the prevalence of SFIs in different parts of the world (Tom *et al.*, 2019). Polyenes, azoles, and allylamine/benzylamines are the three types of topical antifungal medicines. Oral medications like as itraconazole, terbinafine, fluconazole, and griseofulvin can be administered as continuous or pulse therapy in certain situations (Fernandes *et al.*, 2020). Improved cleanliness, as well as the avoidance of moisture and occlusive clothes, are crucial for a successful treatment (Demirseren, 2020). The most critical factors are a weakened immune system and exposure to filaments or spores in the environment. *Candida* spp. were thought to be responsible for the majority of fungal infections until a few years ago, but the most common pathogens have shifted over time. Molds are currently responsible for the majority of invasive fungal infections (IFDs) in highly immunocompromised patients (Pagano *et al.*, 2011).

Material and Method

The study was conducted in health institutions affiliated to the Dhi Qar Health Department (Al-Haboubi Teaching Hospital/Specialized Center for Oncology, Nasiriyah Teaching Hospital, Diabetes and Endocrinology Center , Genetic Blood Diseases Center). A descriptive cross-sectional study design was conducted with questionnaire items. This study includes 500 samples from patients those with superficial fungi due to a weak immune system during the use of a convenience sample selected throughout the use of non-probability sampling methods. questionnaire was developed through a comprehensive review of the related literature Which was used as a data collection tool that included socio-demographic characteristics, type of diseases that lead to a possible weakening of the immune system, specific locations of the superficial fungal infection and risk factors for superficial fungi. The questionnaire form was filled out by the researcher during the direct questions to the patient. The statistical package (Spss) (Statistical Package for Social Sciences) version 23 was used to analyses and calculate the data. The application of descriptive statistics.

Result and Discussion

Concerning to the sociodemographic characteristics table (1) shows their mean age of participant was 44 years, 310(62%) of the were males, about 346 (69.2%) of them were from urban residence, about 227 (45.4%) of them were not working, most of them were married 309 (61.8%), 185(37%) of them unenlightened.

Table 1
The basic demographic data of study population

Variables		Mean±SD	Median (min-mix)
Age in years		44.3+20.1	50(2-80)
		Frequency	Percent
Gender	Female	190	38.0
	Male	310	62.0
Residence	Urban	346	69.2
	Rural	154	30.8
Marital Status	Single	128	25.6
	Married	309	61.8
	Divorced	8	1.6
	Widow	55	11.0
Occupation	Employee	52	10.4
	Housewife	68	13.6
	Student	71	14.2
	Retired	46	9.2
	Not working	227	45.4
	Smith	4	0.8
	Worker	8	1.6
	Cook	3	0.6
	Driver	7	1.4

		Farmer	7	1.4
		Soldier	6	1.2
		Others	1	0.2
Educational level	Unenlightened		185	37.0
	Preparatory		37	7.4
	Primary		157	31.4
	Middle		55	11.0
	Diploma		29	5.8
	Bachelors		32	6.4
	higher diploma		1	0.2
	Master		3	0.6
	Ph D		1	0.2

N=500

Regarding the distribution of study population according to immune compromised. The study revealed the highest percentage 247(49.4%) was found to be among patient suffer from diabetes militias while the lowest percentage 22(4.4%) was found to be among patient suffer from renal failure as appear in figure 1

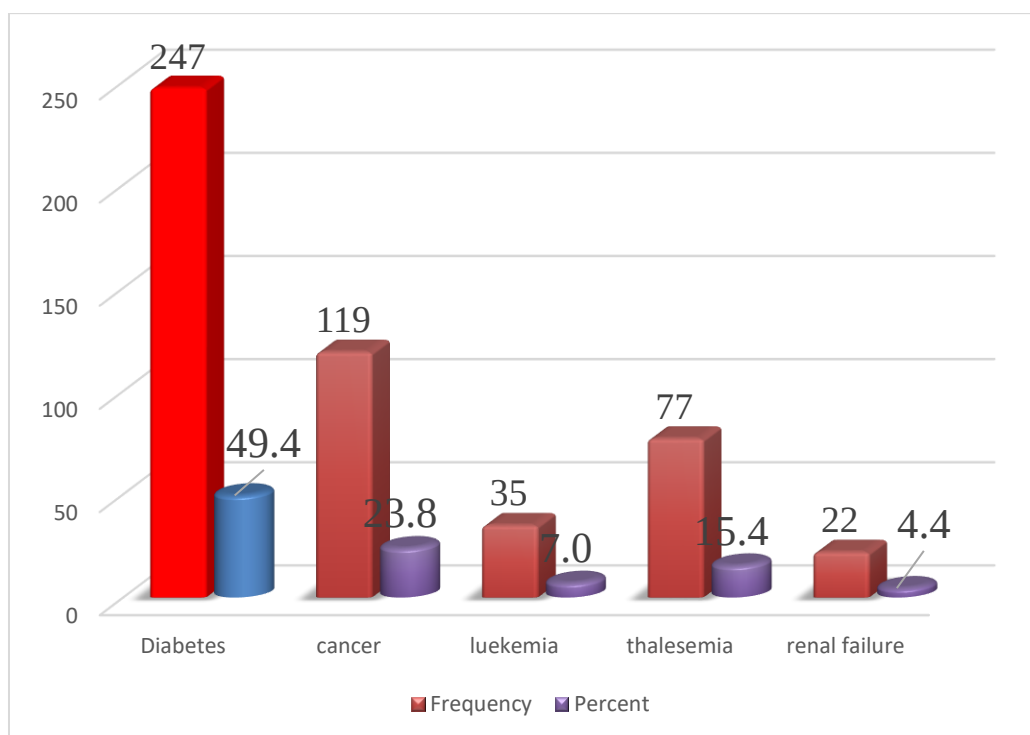


Figure 1. distribution of study population according to immune compromised diseases

However, table 2 shows the relationship between the answer about site of fungal infection and gender. The study found answer of male participants more than female participants about questions that include: "Do you have fungal infection in

the mouth?” statistically significant at p value 0.001; “Do you have Fungal infection in the head?” at p value 0.009, “Do you have Fungal infection in the foot?” at p value 0.001 except in question “Do you have Fungal infection in the groin” was female more than male at p value 0.004. while, non-significant with other rest question at p value of >0.05.

Table 2
Association between answers about site of fungal infection and gender

N	Questions	Answer	Gender				Total	Sig
			Female		Male			
			N	%	N	%		
1	Do you have fungal infection in the mouth?	Yes	82	16.4	182	36.4	264	0.001
		No	108	21.6	128	25.6	236	
2	Do you have Fungal infection in the head	Yes	23	4.6	66	13.2	89	0.009
		No	167	33.4	244	48.8	411	
3	Do you have Fungal infection in the fingernails	Yes	12	2.4	26	5.2	38	0.396
		No	178	35.6	284	56.8	462	
4	Do you have Fungal infection in the toenails	Yes	21	4.2	35	7	56	0.935
		No	169	33.8	275	55	444	
5	Do you have Fungal infection in the face	Yes	15	3	26	5.2	41	0.846
		No	175	35	284	56.8	459	
6	Do you have Fungal infection in the trunk	Yes	51	10.2	85	17	136	0.888
		No	139	27.8	225	45	364	
7	Do you have Fungal infection in the hand	Yes	39	7.8	53	10.6	92	0.337
		No	151	30.2	257	51.4	408	
8	Do you have Fungal infection in the foot	Yes	77	15.4	78	15.6	155	0.001
		No	113	22.6	232	46.4	345	
9	Do you have Fungal infection in the toes	Yes	12	2.4	17	3.4	29	0.699
		No	178	35.6	293	58.6	471	
10	Do you have Fungal infection in the groin	Yes	177	35.4	20	4	33	0.004
		No	13	2.6	290	58	467	
11	Do you have Fungal infection in the eye	Yes	45	9	84	16.8	129	0.397
		No	145	29	226	45.2	371	

Table 3 clarifies that the male patients statistical significantly more than female in Immunocompromised diseases include diabetes mellites and cancer except renal failure at p .value of :0.002

Table 3
Distribution of immune compromised disease categorized by gender

N	Immunocompromised disease	Gender				Total	Sig
		Female		male			
		n	%	n	%		
1	Diabetes	97	19.4	150	30	247	0.002 ^b
2	Cancer	26	5.2	93	18.6	119	
3	Leukemia	14	2.8	21	4.2	35	
4	Thalassemia	39	7.8	38	7.6	77	

5	Renal Failure	14	2.8	8	1.6	22	
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According the Distribution of immune compromised patients categorized by age group. The results show thalassemia patient statistical significance different from in distribution infection categorized by age group from other immune compromised patients at a p.value of: 0.000 as appear in table 4

Table 4
Distribution of immune compromised patients categorized by age group

N	Disease	age group							
		less than 18		18-45		More than 45		Total	Sig
		No	%	No	%	No	%		
1	Diabetes mellitus	15	6.1%	53	21.5%	179	72.5%	247	.000 ^b
2	Cancer	4	3.4%	43	36.1%	72	60.5%	119	
3	Leukemia	6	17.1%	15	42.9%	14	40.0%	35	
4	Thalassemia	51	66.2%	25	32.5%	1	1.3%	77	
5	Renal failure	1	4.5%	7	31.8%	14	63.6%	22	
6	Total	77	15.4%	143	28.6%	280	56.0%	500	

Discussion

Fungal diseases are major public health problem and widely distributed all over the world. It varies with different age group of patients (Awal et al., 2014). have reported that 39% of patients with diabetes had fungal growth in their study. Our results were higher than the results stated by a study from our country (Najem et al., 2016), and findings depicts that the frequency of fungal infection has increased in years. These results led to the hypothesis of a close correlation between SFI and high levels of blood sugar (Romano *et al.*, 2001). This result is similar to several study which reported that a statistically significant relation between dermatophytes infection and gender of the patients had been observed in the present study where the dermatophytes infection was higher in males with 59.6% cases, in comparison to females with 40.4% cases. The incidence of dermatophytosis in males was more than females in many earlier studies a finding in line with the present study (Rashidian et al, 2015, Rahman, 2011 , Sahin et al., 2004, Brajac et al., 2004, Brajac et al., 2011). On the other hand, the results inconsistent with other studies where the incidence of dermatophytosis was higher in females than males (Vella Zahra et al., 2003, Hay et al., 1998). This difference between dermatophytes infection and gender of the patients may be due to physiological differences between male and female, life style and the differences in the social behavior (Mahmoudabadi, 2005). Dermatophytosis does not spare people of any age. Although the disease occurs in all ages and is common in young adults of both sexes, its frequency is variable. This may depend on the nature of job, personal hygiene and the climatic condition. The lower incidence in females may be also due to the nonreporting of the female patients to the hospitals and men physicians due to the social and religious habit (Sadeghi et al., 2011). Although the real incidence of the fungal infections had increased, its actual frequency is often under-evaluated because of the difficulty in diagnosis

but the invasive procedures, e.g. histological samples, bronchoalveolar lavage, and biopsies to be cultured is often in association with cytopenia or critical condition of those patient (Al-Wattar, 2020).

Conclusions and Recommendations

Superficial fungal infections are still a public health problem in the world. Through the results it was found that the incidence of fungi is more in men than in women. diabetes was common risk factor for SFIs so it is necessary to provide special care for this group who have diagnostic, therapeutic and prophylactic needs in relation to fungal diseases.

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