

EPIDEMIOLOGY OF SUPERFICIAL FUNGAL SKIN INFECTIONS IN PATIENTS ATTENDING ZLITEN TEACHING HOSPITAL

Tarek Mohamed Arshah¹, Abdalla Muftah al-bakosh², Mostafa Mohamed Mohamed Ali³, Huda Ashour Ramadan⁴, Safa Salem Alshawish⁴, Mabroka Alfatih Algondy⁴, Amna Alrtail⁵, Moftah M. Rzeg⁵

¹ Dermatology department of Zliten Teaching Hospital, Faculty of medicine of Elmergib University, Libya., ² Microbiology department of El-asmara Islamic university, Zliten, Libya., ³ Biology and Microbiology department, Faculty of Science of Elmergib University, Libya., ⁴ Biology department, Faculty of Science of El-asmara University, Libya., ⁵ Microbiology department of Zliten Teaching Hospital.

Corresponding author: Tarek Arshah. Dermatology department of Zliten Teaching Hospital, Faculty of medicine of Elmergib University, Libya. P.O.Box 24 Zliten, Libya.
E-mail: tarek61904@yahoo.com

ABSTRACT

Superficial fungal infection of skin and its appendages is common health problem worldwide. Dermatophytosis and Pityriasis versicolor are the main superficial fungal infections in humans. The risk factors are hot humid environment leading to excessive sweating, and contact with animals. 3303 patients of various skin complaints were examined at outpatient Department of Zliten Teaching Hospital over a period of 9 Months. Retrospective study was carried out to analyze the data to find out the distribution pattern of different clinical types in relation to age and sex. 161(4.9%) patient were found to be affected with superficial fungal infection. 22.9% of infected patients were less than 7 years old, followed by age group from 21-27 years(14.9%). Male to female ratio was 1.2:1. The most frequent clinical pattern were, Tinea capitis (25.5%), followed by Tinea pedis (22.4%), Tinea corporis (21.7%) and Pityriasis versicolor(18.6%). Tinea capitis where the most frequent superficial fungal infection before 14 years of age, and Pityriasis versicolor was the most frequent fungal infection in the age group 13-20 years.

Keywords: Epidemiology, superficial fungal infection, Dermatophytosis, Pityriasis versicolor, tinea capitis.

1. INTRODUCTION

The Fungi are living organisms present in our environment and there are fungi considered to be normal flora such as *Malassezia furfur*. However, the organisms affect humans and cause disease.¹ Furthermore, the non-dermatophyte molds could be a cause of fungal infection of nails (Onychomycosis).² Fungal infections of skin, nails and hairs are one of most frequent diseases and in the last decades, the prevalence of fungal infections of skin and appendages has increased to affect around 25% of population of different world societies.³ Marques *et al* (2000) found that Dermatophyte infections of skin affect one fifth of world's population⁴.

The superficial mycoses are mainly confined to stratum corneum (upper layer of Epidermis) and cornified appendages (hairs and nails).² Dermatophytosis, is a group of important superficial fungal infections of skin and its appendages and are caused by three etiologic species of dermatophytes, which are microsporum, trichophyton and epidermophyton, and each type of these three is characterized by specific morphologic features of cultured colonies and of Macroconidia under Microscope. Dermatophyte infections of skin also known as ringworm infections and named after affected part of the body, e.g. Tinea capitis and Tinea pedis.⁵ Symptoms and signs of Dermatophyte infections of skin and its appendages differ according to the affected site of the body and the source of fungi. Generally, skin lesions are scaly well defined erythematous plaques with active margin showing more scales with or without vesicles and pustules. The lesions tend to extend peripherally and clear centrally. Zoophilic fungi exhibit more inflammation compared to anthropophilic fungi.² Another common superficial mycoses is Pityriasis versicolor which is mainly caused by *Malassezia furfur* which is

yeast fungus, the skin lesions are round or oval macules in different colours (white, red and brown) with fine scales.^{2,6}

The risk factors of cutaneous fungal infections are hot, humid climate, which encourages sweating and appearance of fungal infections of skin; furthermore contact with infected animals, like cats could lead to skin infection of humans with zoophilic fungi.⁶

In Libya, there are few studies were conducted about superficial fungal infections, furthermore, no previous studies about this issue were performed in Zliten. To know about the Epidemiology of dermatophytosis and Pityriasis versicolor in this area we have conducted this study.

2. METHODS AND SUBJECTS

2.1 Area Of Study

Zliten is a Libyan city with more than 263,000 people and located on Mediterranean Sea about 150 kilometers east of Tripoli, with hot weather and high humidity in summer months.⁷

2.2 Subjectives

This study carried out to discover the Epidemiology of dermatophytosis and Pityriasis versicolor in Zliten.

2.3 Methods

The data for all patients were used for retrospective study, the patients who have seek dermatological advice at outpatient Department of Zliten Teaching Hospital. The study was carried out in the period of time from 01.10.2014 until 30.06.2015. All patients were from area of study. Patients were examined with wood's lamp, scraping of skin, nails and hairs were

examined under microscope with use of KOH 20% solution. The culture of scrapings were used to reach definitive diagnosis. Scrapings were taken with sterile scalpel into a glass slide and 20% potassium hydroxide (KOH) as aqueous solution were applied and the slide was covered with cover slide and the scraping examined under microscope. For culture purposes, scraped site was cleaned aseptically with 70% ethanol and scales were directly collected into petri dishes. The culture was performed on Sabouraud dextrose agar media with typical formula containing mycological peptone 10.0: glucose 40.0: Agar 15.0; petri dishes were incubated at 26°C and the growth of cultures was observed twice weekly and petri dishes were discarded only after 3 weeks in the absence of growth. When Pityriasis versicolor is clinically suspected, the examination with Wood's lamp in dark room is performed, but our diagnosis in cases of Pityriasis versicolor were mainly clinical.

2.4 Statistical Analysis

The data were analysed with use of SPSS 20 to study the distribution and frequency of superficial fungal infections of skin, hairs and nails.

3. RESULTS

A total number of 3303 Patients sought medical advice because of skin problems at outpatient Department of Zliten Teaching Hospital. 161/3303 (4.9%) were found to have superficial mycosis, 88/161 (54.7%) were males and 73/161 (45.3%) were females. The ratio of male to female was 1.2:1. The age of patients ranged from 1 to 80 years (mean, 25.3 years). Of 161 patients, 37 (22.9%) of patients were located in the range between 0-6 years old, followed by age group from 21-27 years (14.9%). We observed that 36% of patients with superficial fungal infection were less than 14 years

old(childhood age group). 34.2% were found to be in age groups from 14 to 34 years which represent adolescence and adulthood. The age groups from 35 to 55 years were found to represent 24.2% of total. From above mentioned results, we find out that about 94.4% of patients with superficial fungal infection are less than 56 years old. The frequency of occurrence of superficial fungal infections in different age groups and sex are shown in (Figure 1) and (Table 1).

In relation of clinical type of fungal infection to age group, in children less than 7 years, tinea capitis constituted 67.6% of different superficial fungal infections, while Pityriasis versicolor represented 46.2% in age group from 14-20 years.

The most common fungal infection was Tinea capitis (25.5%), followed by Tinea pedis, which represented 22.4% of total cases of superficial fungal infections, followed by Tinea corporis (21.7%) and Pityriasis versicolor (18.6%). However, Tinea unguium represented only 6.2% of total superficial fungal infections. The lowest frequent superficial fungal infection was Tinea manuum (Figure2).

The pattern of specific types in relation to different age groups were characteristic. Regarding distribution of Tinea capitis in different age groups, children before 13 years old were found to be more susceptible. Adults were rarely to be affected with Tinea capitis. changed pattern of frequency distribution of Tinea capitis in relation to early age groups (childhood and young adults) is given in figure 3. Conversely, Pityriasis versicolor were found to occur more frequently between 13 years and 35 years old (Figure 4). Tinea pedis were more frequent in the age groups from 28 to 55 years (Table1).

TABLE 1 THE FREQUENCY OF OCCURRENCE OF DIFFERENT SUPERFICIAL FUNGAL INFECTIONS IN 161 PATIENTS

Diagnosis	Number (%)													
	Different age groups (years)											gender		Total
	0-6	7-13	14-20	21-27	28-34	35-41	42-48	49-55	56-62	63-69	>=70	Male	female	
<i>Tinea capitis</i>	25 (67.6)	10 (47.6)	4 (30.8)	1 (4.2)	1 (5.6)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	23 (26.1)	18 (24.7)	41 (25.5)
<i>Tinea faciei</i>	3 (8.1)	0 (0.0)	0 (0.0)	1 (4.2)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (1.1)	3 (4.1)	4 (2.5)
<i>Tinea corporis</i>	5 (13.5)	3 (14.3)	3 (23.1)	8 (33.3)	4 (22.2)	4 (33.3)	3 (20)	4 (33.3)	0 (0.0)	0 (0.0)	1 (25)	19 (21.6)	16 (21.9)	35 (21.7)
<i>Tinea manuum</i>	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (5.6)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (1.4)	1 (0.6)
<i>Tinea cruris</i>	1 (2.7)	0 (0.0)	0 (0.0)	2 (8.3)	0 (0.0)	1 (8.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	2 (2.3)	2 (2.7)	4 (2.5)
<i>Tinea pedis</i>	3 (8.1)	2 (9.5)	0 (0.0)	2 (8.3)	4 (22.2)	5 (41.7)	8 (53.3)	6 (50)	3 (75)	1 (100)	2 (50)	22 (13.7)	14 (19.2)	36 (22.4)
<i>Tinea unguium</i>	0 (0.0)	4 (19.1)	0 (0.0)	1 (4.2)	2 (11.1)	0 (0.0)	3 (20)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	3 (3.4)	7 (9.6)	10 (6.2)
<i>Pityriasis versicolor</i>	0 (0.0)	2 (9.5)	6 (46.2)	9 (37.5)	6 (33.3)	2 (16.7)	1 (6.7)	2 (16.7)	1 (25)	0 (0.0)	1 (25)	18 (20.5)	12 (16.4)	30 (18.6)
Total	37 (22.9)	21 (13)	13 (8.1)	24 (14.9)	18 (11.2)	12 (7.5)	15 (9.3)	12 (7.5)	4 (2.5)	1 (0.6)	4 (2.5)	88 (54.7)	73 (45.3)	161 (100)

rence of superficial fungal

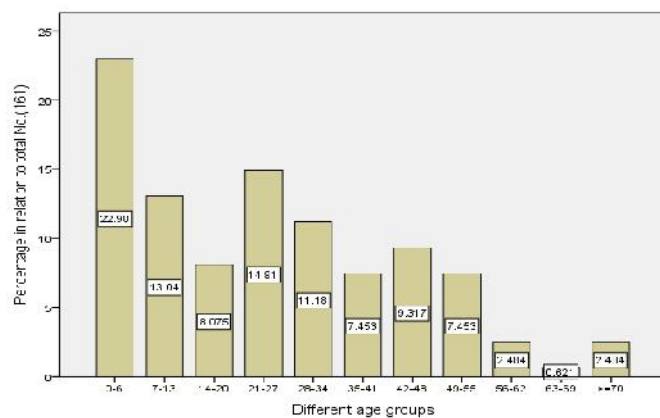


Fig.1 Graph, representing the frequency of occurrence of superficial fungal infections in different age groups

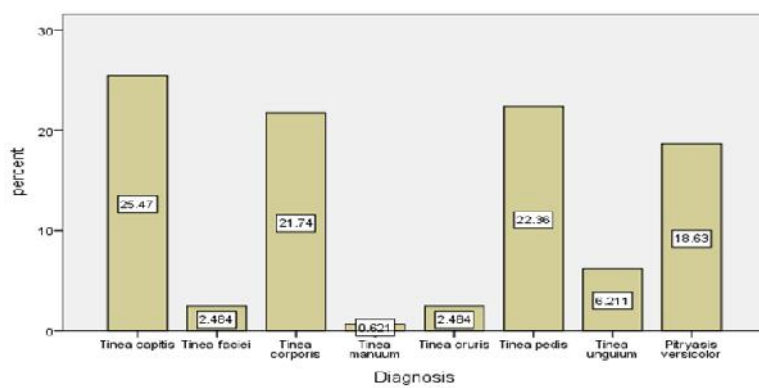


Fig.2 Frequency of each type of superficial fungal infections.

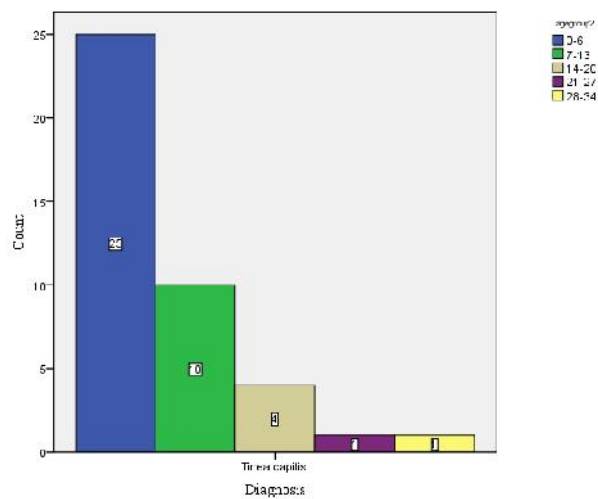


Fig.3 Change pattern of frequency distribution of tinea capitis in relation to early age groups (childhood and young adults)

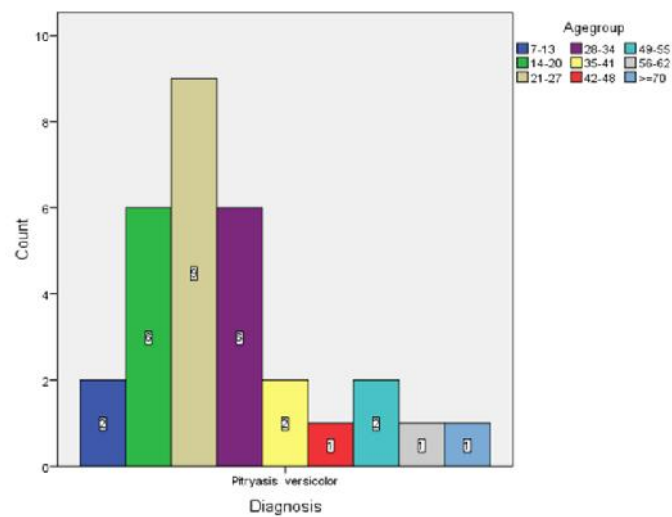


Fig.4 Frequency distribution of Pityriasis versicolor in different age groups.

4. DISCUSSION

The real prevalence of superficial mycoses of skin in Libya is not known because of the superficial fungal infections are not noticeable diseases.⁸

In this study the mean age of patients with superficial fungal infections was 25.3 years which is relatively similar to results of studies conducted in Kosova (30.8)⁹and in Monastir region in Tunisia (33 years).¹⁰

The frequency of fungal infections was dramatically reduced after 55 years of age and this corroborate the finding in one Egyptian study¹¹ and opposite the finding of study conducted in Malaysia, in which the most of patients were older than 50 years.¹²This variation may be related to variations in demography, geography and exposure to risk factors.

Male to female ratio in our study was 1.2, identical to result in study conducted in Malaysia, and opposite what was found in Tunisia with male to female sex-ratio (0.82).^{10,12}

In this study, the most susceptible age group was children less than 7 years, similar to what was found in Tripoli(Libya)⁸, in which the majority of patients(85%) were children less than 15 years old, and also similar distribution was found in patients attending to some hospitals in Egypt and the susceptibility was high to tinea capitis, same to our finding.¹¹ The second more affected age group in our study was from 21 years up to 27 years, showing more frequent Pityriasis versicolor. While in study conducted by (Kaur *et al*, 2015) the age group 21–30 years was the most affected followed by age group 31–40 years.⁶

In study about childhood dermatomycoses in Sfax Hospital in Tunisia, They have found that Tinea capitis was the most frequent before 13 years of age,

and Pityriasis versicolor was the most frequent after 13 years of age. This finding corroborated with our results.¹³

In our study tinea capitis represented 25.5% of all superficial mycosis, taking in consideration that candidiasis were not involved in our study, this distribution of Tinea capitis is similar to that found in patients attended to three hospitals in Egypt and Sfax in Tunisia, which found to be 69.4% in Tunisia and 28.6% in Egypt and followed with Tinea pedis in our study and in Egypt, but followed with Tinea corporis in Sfax (Tunisia). Tinea corporis in our study has represented 21.7% of total while has only formed about 15% in some hospitals in Egypt.^{11,13}

5. CONCLUSION

Superficial cutaneous mycosis is worldwide health problem and this study has improved our understanding of epidemiology of such common fungal infection in Zliten area. 22.9% of infected patients were less than 7 years old, followed by age group from 21-27 years(14.9%). In contrast, Infection was less frequent after age of 55 years (5.6%). The most frequent clinical type was Tinea capitis (25.5%), followed by Tinea pedis, Tinea corporis and Pityriasis versicolor in descending order (22.4%,21.7%,18.6%).

REFERENCES

1. Hay R.J., Ashbee H.R. Mycology. Burns T., Breathnach S., Cox N., Griffiths C. 2010. *Rook's Textbook of clinical dermatology*. Wiley-Blackwell, PP: 36.1-36.92.
2. El-Ghameriny M.S. 2014. Cutaneous fungal infections. *Ghameriny's textbook of clinical dermatology*; PP: 903-986.
3. Havlickova B., Czaika V., Friedric M. 2008. Epidemiological trends in skin mycoses worldwide. journal compilation. Blackwell publishing Ltd. Mycoses; 51: 2-15.
4. Marques S.A., Robles A.M., Tortorano A.M., Tuculet M.A., Negroni R., Mendes R.P. 2000. Mycoses associated with AIDS in the Third World. *Med Mycol*; 38 Suppl 1:269–279.

5. Andrews M.D., Burns M. 2008. Common tinea infections in children. *American family physician*; 77:1415-1420.
6. Kaur R, Panda P.S , Sardana K, Khan S. 2015. Mycological Pattern of Dermatomycoses in a Tertiary Care Hospital. *Journal of Tropical Medicine*; 1: 1-5.
7. Monthly Report on population number and statistics of Zliten Office for Civil Registration. Dec. 2015.
8. Ellabib M.S., Khalifa Z. M. 2001. Dermatophytes and other fungi associated with skin mycoses in Tripoli, Libya, *Ann Saudi Med*; 21:193-195.
9. Kocinaj A. F., Kotori M. G., Koraqi A, Fida M. 2015 Dermatomycosis frequency and localization sites. *Med Arh*. Feb; 69: 58-59.
10. Khorchani H., Haouet H., Amri M., Zanned I., Babba H., Azaiz R. 1996. Epidemiological and clinical profile of superficial mycoses in Monastir region (Tunisia). *Arch Inst Pasteur Tunis*;73:179-84.
11. Abd ElmegeedA. M., Ouf S.A., Moussa T. A.A., Eltahlawi S.M.R. 2015. Dermatophytes and other associated fungi in patients attending to some hospitals in Egypt. *Brazilian journal of Microbiology*; 3: 799-805
12. Murtaza M., Rajainthran S., George B.A. 2013. Mycological Study of Superficial Mycoses at the Skin Clinic in Sabah, Malaysia. *International Journal of Pharmaceutical Science Invention*; 2: 45-48
13. Sellami A., Sellami H., Makni F., Mezghani S., Cheikh-Rouhou F., Marrekchi S., Turki H., Ayadi A. 2008. Childhood dermatomycoses study in Sfax Hospital, Tunisia. *Mycoses*; 51: 451-454.